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NUNQUAM ALIUD NATURA, ALIUD SAPIENTIA DICIT.

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G. A. GIBSON, M.D., F.R.C.P.Ed.

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THE
EDINBURGH MEDICAL JOURNAL.

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EDINBURGH MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

ON THE TEACHING OF MIDWIFERY.[1]

By R. Milne Murray, F.R.C.P.Ed., *President, Physician to the Royal Maternity and Simpson Memorial Hospital; Lecturer on Midwifery and Diseases of Women, School of Medicine, Edinburgh.*

The time has now arrived when it falls to me to restore to you the trust you placed in my hands when, two years ago, you elected me to the Presidentship of the Edinburgh Obstetrical Society. Before I do so, I desire to take this opportunity of thanking you most cordially, not only for the great honour you did me in electing me to this chair, but more especially for the kindness and consideration you have, during my tenure of the office, invariably extended to me.

I accepted the office with diffidence, in view of the traditions which cling to it; but, apart from a consciousness of many shortcomings in the discharge of its duties, these two years during which I have had the honour of presiding over your deliberations will remain with me as a memory associated with the keenest pleasure.

I feel sure I may also take this opportunity of thanking in your name, as well as on my own account, the various officials of this Society, whose interest in its welfare and whose energy on its behalf do so much to maintain its traditional vigour and vitality.

We owe our best thanks to our secretaries, Dr. Haig Ferguson and Dr. Fordyce, not only for the efficient discharge of their routine duties, but also for the energy they have shown in securing for each meeting a billet full of attractive papers and interesting specimens.

To Dr. Brewis, our editor of *Transactions*, we also owe our hearty acknowledgments. The new departure which we made last session in obtaining shorthand reports of our discussions, while it has, I feel sure, greatly enhanced the value of our *Transactions*, has also greatly added to the duties of the editor. That these have been worthily discharged, I think you will admit, our new volume shows.

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[1] Valedictory Address, delivered to the Edinburgh Obstetrical Society, November 13, 1901.

Less exacting are the duties of our librarian, Dr. Haultain. They are indeed, at the present time, largely mechanical, consisting in the main in carrying home with him, for safe keeping, the various volumes which the kindness of cognate Societies send us in exchange for our *Transactions*. For the discharge of these duties of transport and storage, which our librarian so faithfully performs, we tender him our thanks; and I have no doubt that if the Society can some day see its way, as I venture to hope it will, to establish a local habitation for its library, which is already considerable, and which could readily be extended, we shall find in our librarian one who is in every respect equal to the task of arrangement and organisation.

When I come to speak of our obligation to our treasurer, I am indeed at a loss to find suitable words. No higher testimonial to the devotion and faithfulness which he brings to the discharge of his duties need be sought, than that which we find in the financial statement which he has just submitted to us. For six-and-twenty years Dr. Craig has served this Society, in the office of treasurer, faithfully and well—how faithfully and well, those of you who have joined our ranks in recent years may in a measure realise, when I say that the position of our Society, as to membership and as to finances, we owe chiefly to the manner in which our treasurer has discharged the duties of his office.

We are well aware that to Dr. Craig we owe the suggestion that the annual volume of the *Transactions* should be presented to each Fellow of the Society, and it was by him that the scheme, by which this was possible, was organised and carried out. By this scheme the *Transactions*, which were formerly a cause of loss to the Society, have now become a means of great gain. Not only is our financial position sound, but our membership has been greatly enhanced, and our *Transactions* now reach every corner of the globe. Thus it is that our work here is so widely known and so highly esteemed.

When, at the commencement of last session, Dr. Craig had completed his twenty-fifth year as treasurer, a suggestion was made by many Fellows of the Society, that this happy union, like some of similar duration in other relations, should be appropriately celebrated. This suggestion was considered by your Council in an informal manner, and it was resolved to recommend to you that a modest portion of our surplus funds should be employed to commemorate, in a suitable way, both our treasurer's long and faithful service and our gratitude.

But no sooner did our friend become aware of this proposal, than with a courteous peremptoriness, acquired no doubt by long practice in dealing with negligent and recalcitrant Fellows, he wrote to the secretary requesting that the proposal should be abandoned, commenting on his own services in the most modest way, and declining any such acknowledgment of them as we had proposed to make.

Much as we should have been gratified had Dr. Craig seen his way to fall in with our suggestion, we had no choice but to bow to his wish in the matter. But I am sure I am expressing the feelings of you all when I tender him our cordial thanks for his long and faithful service, and for all the care and time he has bestowed on the duties of his office in the years gone by; and we sincerely hope that he may be able for many years to regulate our finances and control our exchequer.

It is a matter of profound satisfaction to me, that I resign this chair to my successor at a time when the Society is in a state of robust vigour, doing good work and giving ample promise of future efficiency.

Our financial condition is eminently sound. Our membership is increasing in a way which shows that the interest in our work is sincere and widespread, and I think we may feel assured that the quality of our work is not unworthy of the traditions and fame of our Society. It is however meet, at a time like this, when we first assemble at the commencement of a new session, that we should take account of the gaps which the hand of death has made in our ranks during the past two years. During this period we have to mourn the loss of two of our Honorary Fellows.

Dr. George Apostoli, who was elected in 1890, was born in St. Michel-de-Lanes in 1847, and was the son of a physician there. He received his medical education in the military school at Strasburg, and became a Doctor of Medicine of Paris in 1872. He joined the Army Medical Service, and spent seven years in Algeria as a Military Surgeon. Transferred after this to the garrison at Versailles, he devoted himself to ophthalmology; but, soon after, he became acquainted with Tripier, and this changed the direction of his studies, and interested him in electro-therapeutics. In 1882 he retired from the military service, and thereafter turned his attention chiefly to the treatment of fibroid tumours of the uterus. In 1884 the details of his method and the results claimed for it were discussed in an elaborate thesis by one of his pupils, Dr. Carlet, and they were so remarkable that they at once attracted attention. As is well known, the method of Apostoli consists in the transmission of currents of considerable amount—amounts far larger than had ever previously been employed—through the uterus and tumour. This was accomplished by methods, the details of which were carefully worked out by him. To understand the great interest taken in the results gained by Apostoli, we must remember that at this time the surgical treatment of fibroids was in an exceedingly elementary state.

Keith, Tait, and Bantock, among others in this country, Schröder, Olshausen, Sänger, and many others in Germany, were feeling their way to more satisfactory and successful methods of hysterectomy; but even in the hands of Keith, whose results were as good as any and better than most, the operation was anything but an ideal one. It was only natural, then, that the announcement of a method which claimed to cure uterine fibroids symptomatically, with apparently no great risk or other inconvenience, should be hailed with the utmost interest, and speedily put into practice. Its application seemed to involve little risk to the patient, and less skill on the part of the operator; and its practice became the fashion of the day. Keith, who, in spite of his success, welcomed a mode of treatment which promised to relieve him in a great measure of an operation which he always dreaded, became speedily convinced of its utility, and obtained results which, while they were depreciated by some, satisfied him, and encouraged others to persevere. It need hardly be said that the results generally obtained fell far short of the expectations formed. This discrepancy was not difficult to explain. First, there is no doubt that Apostoli's cause suffered from the misinterpretation of his claims, due largely to the forms of expression used by him and his pupils in stating them. His Gallic enthusiasm did his cause an injury which might have been prevented had this enthusiasm been tempered with a modicum of Scottish caution. Secondly, it was unfortunate that the apparent simplicity of the procedure tempted men, who knew little of gynæcology and less of electrical methods, to try their hands, with results which could be easily predicted. On the other hand, some who gave it a fair trial were discouraged, partly by the tedium of the process of treatment, partly by the fact of its uncertainty and inefficiency in certain cases, however gratifying its results might have proved in others. This is not the occasion to discuss at length the ultimate value of Apostoli's contribution to gynæcological therapeutics, but I venture to assert my firm belief that, in spite of its inconveniences, its tedium, and its uncertainties, Apostoli's method would have been in general vogue to-day, had it not been for the extraordinary success which, in the hands of experts, has attended the surgical treatment, by hysterectomy, of fibroid tumours. It is a much more expeditious procedure to extirpate the uterus and tumour by a single operation than to cure it symptomatically by electrical applications during two or three months—always supposing the patient does not die in the former case. But, on the other hand, there are multitudes of women suffering from the presence of a fibroid tumour who shrink from the suggestion of the knife, and refuse to submit to any surgical procedure. That a very large number of these may be symptomatically cured by Apostoli's method does not admit of doubt, and I do not despair of the time coming when a woman may have some choice between a proposal for a hysterectomy and the somewhat melancholy consolation to be derived from the assurance that very few women die from a fibroid.

Sir William Overend Priestley, grand-nephew of the great chemist, was born in June 1829. After a distinguished career in Edinburgh as a student, he took his degree of M.D. with high honours. In 1851 he published a paper on "Pelvic Cellulitis," which attracted the attention of Sir James Simpson, for soon after this Simpson appointed him his assistant. At this time Simpson was in the zenith of his fame, and patients from all parts of the world crowded his rooms. This association was of the highest value to Priestley, for, when he moved to London in 1855, he speedily formed an extensive connection and developed a lucrative practice. No doubt much of his success was due to his connection with Simpson, but more was due to his inherent ability and to the charm of his personality. Shortly after his removal to London he became Obstetrical Physician to the Middlesex Hospital, and also joined the staff of the Samaritan Hospital. On the death of Arthur Farre, in 1863, he was appointed to the Chair of Midwifery in King's College and to the Obstetrical Physicianship of the Hospital. This appointment he held for a short time only, for in 1864 an attack of diphtheria, followed by a tedious recovery, determined him, at the age of 43, to relinquish these appointments and to confine himself to private practice. For many years he was the most fashionable obstetric physician in London. In 1893 he was knighted, and in 1896 he was elected M.P. for the Universities of Edinburgh and St. Andrews, and he retained this seat till his death in April 1900. Priestley's early promise as a contributor to obstetric science and literature was never fulfilled. His premature separation from teaching and his absorption in practice sufficiently explain this. His chief contributions to literature are the Lumleian Lectures on "Intra-uterine Death," and articles on "Hæmatocele" in Allbutt and Playfair's "Gynæcology" and Reynolds' "System of Medicine." It has been well said of him that all through his life he made troops of friends but never an enemy.

From the roll of Corresponding Fellows we have lost one—Dr. Thomas Cayzer of Liverpool.

From the roll of Ordinary Fellows we have lost no less than nine. Dr. John Cunningham, New Zealand; Dr. George Elder, Edinburgh; Dr. John Henderson, Leith; Dr. William Husband, Edinburgh; Dr. William Johnstone, Stirling; Dr. James Thomson, Jersey; Dr. John D. Williams, Cardiff; Dr. James Foulis, Edinburgh; Dr. John Connel, Peebles. Among these we number the two senior Fellows of the Society, Dr. Henderson and Dr. Husband. Both these gentlemen were elected Fellows in 1857.

Dr. William Husband, early in his life, turned his attention to the subject of vaccination, and for many years was Superintendent of the Central Vaccine Institution. His name is best known in connection with the invention of the capillary tube for storing lymph. A man of singular modesty and sincerity of character, and of earnestness and faithfulness in all things, he won and retained the affectionate respect of a wide circle of patients and professional brethren.

The death of Dr. George Elder, in the early days of 1900, after four days' illness, came with a shock of painful surprise to all his many friends. He had endeared himself to many by the simplicity of his character and by his great personal charm, and the work he had already done had proved to be of outstanding promise. We looked to him as one of the younger men who was likely to maintain the traditions and the reputation of our school, and his death at the age of 29 touched us all with a sense of personal loss.

No one who was present at our last meeting, on the 10th July, could have imagined, when James Foulis sat down after having spoken in the discussion on the third stage of labour, with all his characteristic vigour and incisiveness, that we had listened to the last contribution he was ever to make to our debates. Yet even then he spoke in the shadow of death. A neglected attack of influenza, contracted in the spring of this year, aggravated a cardiac ailment, from which he had long suffered, and at the date referred to he was dragging himself through his day's work with a feeling of growing exhaustion and distress. It was characteristic of the man that his interest in our meeting was even greater than his weakness. A short rest in the country during August failed to restore him, and on his return home in September, after a courageous effort to see some of his patients, he lay down, never to rise again; and as the leaves began to fall in October, he passed to his rest. No one who came in contact with Foulis failed to recognise in him a strong personality. You could not doubt the earnestness nor the sincerity of his thoughts, even though his views appeared often unconventional and sometimes bizarre. He had keen scientific instincts, and his interest in the scientific aspects of medicine never flagged. In an early period of his career he did excellent work on the development of the ova, and made a contribution to our knowledge of the highest value; but his absorption in a busy and exacting practice prevented him from following what seemed his natural bent, though to the last he kept his interest in developmental work unimpaired. No one could fail to admire the beauty of the dissections of the early embryo and its membranes which he demonstrated to us here from time to time. When Foulis fairly entered on practice, he gave himself up to his work. His first and last thought was his patients, and his chief anxiety was to find out what was best for their interests. When we consider what he did for them, we need not be surprised that he won their deepest esteem and unwavering confidence. No man was more trusted and no man deserved it more. It is touching to hear the terms of affectionate respect in which he is spoken of by his patients; and it is plain that he was to them not only a trusted physician but also a steadfast friend. We who sit round this table will long miss his familiar face and his ready word, but we shall cherish the memory of one whose love of what is good, beautiful, and true, and whose high sense of duty stamped him a man of sterling worth and character.

By the death of Dr. John Connel of Peebles, which occurred on the fourth of this month, the Society loses one of its most distinguished country Fellows, and one who had been its President. His career as a student, first in St. Andrews and afterwards in Edinburgh, was marked by high distinction, and for many years he has been one of the best known and regarded as one of the ablest practitioners in the south of Scotland. He joined this Society in 1869, and he evinced his interest in our work by frequent attendance at the meetings, often at great personal inconvenience. When, in 1883, the Council resolved to recommend a country Fellow for election to the Presidential chair, Connel was chosen for the honour, and a wise choice it proved. The two addresses he gave from this chair adorn our *Transactions.* They are stamped as the product of a highly cultured mind, and are models of literary form. But they are more than this—they show forth a mind which, by the exercise of a luminous intellect, has attained the highest ideals and reached the deepest convictions. He was one of those men who impress you with the feeling that he never spoke without thinking, and that his thought came from the sanest of brains. The saneness of the man impressed you as much as anything about him—so much so, that if you differed from him you felt it necessary to revise your judgment. I have often thought that if Connel had chosen to specialise, he would have made an admirable consultant; but I am not sure that, even in such a capacity, he would have been so much the power for good he has been, giving himself, as he has done, not only to the individual interests of his patients, but likewise, and with his whole heart, to the social and moral welfare of the community in which his lot was cast.

> "So his life has flowed
> From its mysterious urn a sacred stream,
> In whose calm depth the beautiful and pure
> Alone are mirrored; which, though shapes of ill
> May hover round its surface, glides in light,
> And takes no shadow from them."

At the opening meeting of our last session, within a few weeks of the close of the nineteenth century, I ventured to direct your attention to the melancholy fact that, in spite of all that had been accomplished in the science and art of medicine, the puerperal mortality from septicæmia had not diminished during the past fifty years. I trust it may not seem to you inappropriate that at this, the opening meeting of our first session in a new century, I should ask your attention to one or two suggestions towards bringing the results of obstetric practice more into line with the ideals of obstetric science.

In the address to which I have referred, I expressed the opinion that the results of private practice fell short of those of the best hospital practice, mainly because, in the first place, there was far too much meddlesome interference with a natural process; and, in the second place, because, even when interference was indicated, it was often carried out with a total disregard to those principles which have been the basis of the triumphs of modern surgery in other departments. Now, if I am right in the views I then expressed, and still maintain, it seems to me that the wide persistence of these vices of practice must be due to some radical defect in the teaching of Obstetrics in our schools. It is, to my mind, inconceivable that if men were thoroughly and properly trained in Obstetrics, they could err so greatly, as many of them seem to do, in the very elements of its practice. We must, I fear, if we are to go to the root of the matter, confess that we, who are teachers of Obstetrics, either fail in some way to impress our students with the grave responsibility they incur in assuming the care of women in parturition, or else we fail to equip them with the knowledge requisite to fit them to meet that responsibility. If this is so, it is a matter of the most urgent importance that we should recognise it. I make no apology for bringing this under the consideration of a Society, every Fellow of which is directly interested in the practice of Obstetrics, and whose fellowship includes not only every teacher of Obstetrics in Edinburgh, but most of those in Scotland, and many of those in other countries; and I do not think I presume upon your interest when I ask you to consider with me, how far the teaching of Obstetrics in this country falls short of or realises what that ideal teaching should be.

As the subject is dealt with in all our Scottish and most of our English schools, it falls into two sections—(1) *Midwifery*, which is concerned with the normal function and abnormal manifestations of the reproductive process. (2) *Gynæcology*, which deals with the diseases and disorders of the reproductive organs.

Until comparatively recently the first department absorbed almost all our attention. Our knowledge of the diseases of the organs of reproduction in the female was comparatively limited, our means of diagnosis were indefinite and unsatisfactory, and even more restricted was our power of treating or alleviating them. During the last quarter of last century, however, the great advances, first, in pathological knowledge, and even more so in the department of abdominal surgery, have raised the study of the diseases of the female reproductive organs to be one of the most important in practical medicine. In no department of the healing art have greater triumphs been achieved, in none has the application of scientific principles to the relief of suffering and disease met with a more ample reward. So much is this the case, that we are, year by year, finding the time placed at our disposal becoming more and more inadequate for a reasonable consideration of the full scope of our subject. The increasing importance of Gynæcology tends either to displace Obstetrics from its former position of pre-eminent importance, or, on the other hand, there is the danger that the pressing claims of scientific and practical Obstetrics prevent anything like an adequate consideration of the immense advances which recent Gynæcology has achieved.

Under these circumstances, it is becoming daily more plain to me that some rearrangement of the work which we are required to overtake must be made, unless both subjects are to suffer. It is obvious that there is a grave danger that an attempt to overtake an adequate treatment of Obstetrics, and a reasonable study of modern Gynæcology, in the same time as sufficed twenty-five years ago, is certain to lead to the perfunctory and slipshod treatment of one or both departments, and that much of the gain of recent years may be lost to the student if presented in such a way as to lead to scientific confusion and indefinite perspective.

It seems to me that the time is rapidly approaching when, in the interest of what I deem to be one of the most important departments of scientific and practical medicine, the subjects of Obstetrics and Gynæcology must be dealt with in different courses. This seems absolutely essential if, on the one hand, the young practitioner is to begin his work equipped with a sound knowledge of Obstetrics, and if, on the other hand, the essential principles of gynæcological diagnosis and abdominal surgery are to be adequately taught, or if the scientific knowledge and practical advances of recent years are not to be ignored by the schools.

I am well aware that to some of the teachers in this and other schools, who are specially interested in other departments, a comparatively easy solution of our difficulty presents itself. We are told that, in this school at least, far too much time is devoted to the study of Obstetrics; that half, or less than half, the time at our disposal is ample for our purposes, and that the time saved from Obstetrics may be applied to the necessary expansion of the teaching of Gynæcology.

These gentlemen point out to us that it is absurd that what they term a "limited and restricted subject like Midwifery" should occupy the student for the same length of time as a subject like General Surgery or Medicine. If *they* are expected to overtake the whole subject of Medicine in a hundred lectures, surely fifty should suffice for our small department. This to the casual observer may seem an adequate argument; to my mind it is wholly specious and illusory. In the first place, it is not possible to overtake the whole of the details of the principles and practice of Medicine or Surgery in a hundred lectures or anything like a hundred lectures, and most teachers who confine their prelections to the limits of a single course, restrict themselves to an exposition of the principles of their subject as a whole, and a detailed account of one or more departments of it.

As a matter of fact, most students take two courses on both of these subjects, and even then find a large part of their working knowledge has to be obtained from text-books. And this seems a sufficiently adequate treatment of the subject. If a young practitioner is possessed of a sound knowledge of the great principles which underlie the scientific practice of Medicine and Surgery, and has a reasonable knowledge of the details of the diagnosis and treatment of the more common and urgent maladies and disorders—a knowledge which he can obtain in relation to these subjects in a way which, as I shall show, is entirely denied him in the teaching of Obstetrics—he is sufficiently equipped for entering on the work of his profession, so far as these subjects are concerned. If he is acquainted with the general principles of the treatment of fractures and of fevers, he cannot go very far astray in the management of these conditions, and he is not likely to commit any irreparable blunder in dealing with them, or one which he cannot rectify by the knowledge obtained by the consultation of authorities on the subject.

But in the department of Obstetrics the case is materially different, as a very brief consideration will show you.

The processes of pregnancy, parturition, and the puerperium are, in the majority of cases, perfectly natural functions, which, following physiological laws, require no interference or management, in the strict sense of the term, and which are accomplished with, no doubt, a temporary strain, but without any permanent disability of the individual concerned. As I have said, the great majority of obstetrical cases come under this class; but there is, on the other hand, a very considerable minority of cases in which the process departs from the normal, becomes pathological in the highest degree, and in which two lives may become suddenly jeopardised, and one of them, if immediately saved, exposed to risk of permanent damage and depreciation.

Consider for an instant some of the complications which the ordinary obstetrical practitioner may at any moment be called upon to meet, such as hæmorrhage (accidental, unavoidable, post-partum, or that occurring during an abortion), eclampsia, transverse presentation, face presentation, impacted breech cases, rupture of the uterus, hydrocephalus, prolapse of the cord. How, let me ask, can these be managed on general principles?

Each condition is one which must be dealt with as being *sui generis*, and the most junior of practitioners must be prepared to treat these conditions by himself and at once. There is seldom time to consult books, or to seek the aid of men of more experience or resource. If the appropriate treatment cannot be provided at once, it may be in great measure useless. If a patient is seized with post-partum hæmorrhage, there is nothing to be gained in sending for a consultant. If the man on the spot is not able to stem the flow of blood, the woman will in all probability be dead before the consultant arrives, and his duty will be limited to explaining to the patient's friends, that a certain proportion of cases of labour end fatally from hæmorrhage, in spite of the most skilful treatment. It will perhaps be well for the practitioner if they do not inquire too closely whether this one properly belongs to this category. What I desire to point out, then, is this, that in practical Obstetrics the practitioner is brought face to face with a larger number of cases which are dangerous to life, and which must be dealt with *as they arise*, than he will meet with in either Medicine or Surgery. Further, almost every practitioner will at some time, at any rate, be engaged in obstetrical practice, and liable to be charged with the responsibility of those cases; while many may be so situated, that they may practise in districts where a surgical case is a rarity, and their skill and capacity may seldom be put to the test.

Every one knows that the greater part of the work of a general practitioner is concerned with the ailments of women and children, and the greater part of a woman's troubles are concerned with, or spring from, her functions of reproduction. Therefore I maintain that the most important part of the equipment of the general practitioner is a sound knowledge of the principles and practice of Obstetrics and the elements of Gynæcology. Not only will his reputation be made or marred by his success or failure in this department, but his confidence in himself, and his comfort in his work, will largely depend on whether he possesses such a knowledge of Obstetrics as will enable him to meet, with adequate skill, the pressing and unavoidable demands which will be made on him from time to time in its practice.

This being so, I maintain that a reasonable part of the medical curriculum should be put aside for the training of the student in this department, and my experience as a teacher has proved to me that the time at our disposal is by no means too long. By judicious use of our time it is possible to give a reasonable view of Midwifery and of minor Gynæcology; but it is quite impossible, in the 100 hours of our course, to deal with the great advance of recent Gynæcology, to describe the details of the diagnosis of abdominal tumours and the rarer pelvic diseases, and to consider, with any care, the refinements of the technique of Gynæcological Surgery.

But, on the other hand, there is no real need for the student to master these details. They are outside any reasonable demand that can be made on him, and time spent in trying to master them is time taken from a work of far more pressing importance.

My position, then, is this, that I should confine the ordinary course of Midwifery to a careful review of the whole subject of Obstetrics, and that of the simpler modes of gynæcological diagnosis and the elementary study of the diseases of women; and I should transfer the subject of Gynæcology outside this, including pelvic and abdominal Surgery, to a special course, on the same lines as diseases of the eye usually are dealt with at present.

Our business as a School of Practical Medicine is to equip the young practitioner with a sound working knowledge of his profession in the first place, and in the second to provide every facility for all who desire to devote themselves to special departments of Medicine and Surgery. And it seems to me that, so far as this department is concerned, the rearrangement I suggest is adequate and appropriate. I am well aware that such a rearrangement as I suggest means a new Chair, and that means more money. But that should be no insuperable obstacle. I do not suggest that this should be met by an appropriation from the regal benefaction of Mr. Carnegie. It appears to me that if all the claims that are being made on it are to be satisfied, there will be little left for such a purpose as I suggest.

Whether that gift is to be mainly for good or for evil remains yet to be seen; but it would be wholly evil if, while its institution largely abolishes that inducement to self-denial and sacrifice which has been a traditional pride in a large section of the Scottish poor, it should at the same time dry up the fountain of the benevolence of those who have and to spare.

It has for many years been a prominent feature of the Scottish Universities, that in their medical curriculum they have given an honourable place to the systematic teaching of Midwifery, and I trust that it will never come about that they will have to sacrifice this feature.

I am one of those who believe with the whole heart in the outstanding importance of the systematic lecture as an essential part of medical teaching. Properly used, it is an essential, perhaps the most essential, method of scientific teaching. Though it may have arisen at a time when books were few and costly, it holds its own against books, and it takes a place which no book can fill; nay more, the more that books increase and multiply, the more definite does the value and function of the lecture become, the more is its place and purpose determined and defined. For there can be no doubt that it is utterly impossible for a student, in the time at his disposal, to get from books, however carefully designed they may be, the proportionate conception and knowledge of any subject, such as Medicine, Midwifery, or Surgery, which can be imparted to him in a well-arranged, well-digested course of lectures by a master of the subject. Such a course can only be given by one who already possesses a sound knowledge of the subject he would teach, a knowledge which can only be got by extensive study and a large experience. Such a one can place the subject in a true perspective. He can seize upon principles, shake them free of adventitious details, and present them with a vividness which cannot fail to impress. Moreover, he is not confined to the use of words merely, he can demonstrate by model, by specimen, by experiment—he can appeal to the ear and to the eye at the same time. Then the influence of the living voice must be kept in mind; the impressiveness of the actual personality of the lecturer is of enormous importance, and the earnest voice and manner can inculcate a fact or principle in a way which no elaboration of type or illustration can approach.

So far, then, as the systematic instruction is concerned, we may assume that the training of our students might be put, without much difficulty, on a satisfactory footing.

But the systematic course is only one part (though an important one) of a proper course of instruction in any such subjects as Medicine, Surgery, or Midwifery.

Not less essential is the practical training which is necessary in order to enable him to apply with success the results of his systematic knowledge. What, then, have we to say regarding the practical training in Midwifery which is provided for the Scottish student? Let us see what demands are made on him.

Before he can present himself for a degree, he must show certificates of having either attended twelve cases of labour on his own account, or else that he has managed six cases of labour, and attended the practice of a Maternity Hospital for three months.

Suppose he takes the former alternative, what has he learned from it? Not much, I fear. It may be that, though he has attended the summons with all expedition, he may have arrived, on some of the twelve occasions, after the event is completed, and his function is limited to certain inquiries which are now of a purely historical interest. And even had he been present at them all, what has he gained by it? He has not seen one of them conducted by any one more competent than himself. He has never been shown how to prepare a patient for examination, far less how to examine or when to examine,—*he has not even been shown how to wash his hands!* If he is of an observant turn, he may have attained some knowledge of the phenomena of labour, but as to how to regulate the process or how to determine when the process requires regulation, he has learned nothing. In fact, at the end of his course of practical training (save the mark!), his proficiency as an obstetrician is comparable to that of a physician who has listened to a lecture on heart disease, but has never listened to the heart. They are both equally incompetent, but the former is ten times more dangerous! For if, by the mercy of Providence, his twelve cases survive, he may readily conclude that he was the chosen agent in their recovery. He thus begins his course in blundering ignorance and he ends it in fatuous assurance.

What would our surgical and medical friends say to a proposal to train their students, not in the wards or theatres of the Infirmary, by watching the practice of skilled teachers, but by each student on his own account applying, as best he could, to the wants of the patients, in their own homes, the principles laid down in the lecture room ?

But suppose, on the other hand, that the student takes advantage of the alternative course open to him, namely, to attend six cases of labour and to follow the practice of the Maternity Hospital for a term of three months, he has certainly made the wiser choice.

And I should like to take the opportunity of recalling the great obligation that our School of Medicine owes to my friend and master, Dr. Halliday Croom, who was the first to institute a course of Clinical Midwifery in the wards of the Royal Maternity Hospital. To Dr. Croom's enthusiasm we owe the institution of this course in 1878, when he was appointed ordinary physician to that institution, and I well remember the characteristic energy with which he threw himself into the organisation and conduct of the course, and the eagerness and delight with which his teaching was followed by the large number of men who joined his clinique. His example was followed by the other physicians, and for twenty-three years it has been an important and integral part of the teaching of practical Midwifery in Edinburgh. I do not think it is possible to over-rate the importance of the departure then made, and I do not think that the debt the School owes to Dr. Croom has ever been adequately recognised. It is therefore no small pleasure to me, who was one of his earliest pupils, as well as his first resident, to employ some of the last words which I shall address to you as President of this Society, in recalling the fact that the honour of instituting the teaching of Clinical Midwifery in Edinburgh belongs to Dr. Croom.

But important and far-reaching in every sense as this teaching has been, I feel sure that Dr. Croom will be the first to admit that, mainly owing to the conditions under which it has at present to be carried out, it falls short of ideals. Let us consider how this is. The class meets twice a week at appointed hours, so that twenty to twenty-four hours are put in by the student during a trimestre. Now, by taking advantage of patients who may be admitted a few days before the end of pregnancy, as well as of those who from time to time come for advice during pregnancy, it is possible to train the students with comparative fulness in the diagnosis of pregnancy and the prognosis of labour, so far as that depends on the presentation and position of the fœtus, and on the character of the pelvis and other conditions on the part of the mother.

It is also possible to consider with fair fulness the phenomena of the puerperium, the involution of the uterus, the process of lactation, and the diagnosis and treatment of the usual abnormalities of the puerperal state. The number of the men attending create some difficulties, but, on the whole, men who are anxious to learn, learn a good deal.

But, on the other hand, it is quite impossible to teach in any adequate way the details of the *management* of labour. It is a fact that many students have attended the whole course in the Hospital, and have never seen a single case of labour within its walls. It may happen that, for the entire period of three months, no case of labour may occur on the day and at the time of the clinique, and consequently it is impossible to demonstrate the proper procedure at the most critical and anxious time of the whole process of reproduction. I am not over-stating the case when I say that our course of Clinical Midwifery is thus lamentably inadequate. And as matters stand now, it is so, and it must be so.

It comes to this, then, that the vast majority of Edinburgh students (and so far as I can gather it is much the same in most other places) leave Edinburgh without any experience in the proper conduct of labour, normal or abnormal. Very few of them have seen an ordinary labour conducted from start to finish, by one competent to demonstrate how little is required on the part of the accoucheur in the management of an ordinary labour, nor have they been shown with what scrupulous care that little has to be done. Not one in ten has seen the forceps applied, and fewer still have seen any of the other obstetric manipulations or operations.

This, then, is the best that Edinburgh can offer them. It is better than it had to offer twenty-five years ago; but its meagreness, in the face of what is required, has only to be stated to be obvious.

Can we be surprised if men leave us and go into practice with little or no idea of their responsibilities? Can we wonder if the advances of modern Surgery have no counterpart in modern Midwifery?

Suppose for a moment that the training of the surgical student were on parallel lines, where would surgical practice be? Suppose, for instance, that the surgical student, after attending his course of lectures, were taken round the wards of the Infirmary, shown the several patients, and taught the details of surgical diagnosis and the after treatment of surgical operations, but, on the other hand, was carefully excluded from the operation room. Not only is he never allowed to see the operations, but he also is prevented from seeing the preparation of his patient, before the knife is allowed to touch him, the equally careful preparation of the knife before it is brought near his patient, and the no less scrupulous preparation of the surgeon before he touches either knife or patient. Could we be surprised if such a student concluded that the really important element in Surgery was diagnosis and after-treatment, and that the conduct of the operation was of minor consequence?

And that might be the reasonable conclusion of any student after attending our Maternity course.

The question, then, is, How is this deficiency in practical teaching to be remedied? My answer is, By a reorganisation of our Maternity Hospital to an extent which will enable students to obtain as sound a practical training in Obstetrics there, as they do in practical Surgery in the wards of the Royal Infirmary. At the present time there are between 300 and 400 women delivered annually in the Royal Maternity Hospital. Were we able to utilise these cases as a means of clinical instruction, we could practically educate a very considerable number of students. But as the time when these cases are to occur cannot be regulated, we must arrange that the students are available whenever the case is in progress. Obviously this can only be done if we have the students living in the Hospital, or in a place of ready access to the Hospital.

Thus the first necessity is a students' residence. It need not be a large one—if it is capable of containing twelve students it would probably meet the case. The course of instruction and residence might probably be limited to four or five weeks, so that by this means 140 students or thereby might receive instruction in the course of the year, and thus practically every case occurring in the Hospital could be made available for teaching. This idea is not new, and I feel sure, from what I have heard and know of students, it would be eagerly taken advantage of by them; and, moreover, once fairly instituted and organised, I am confident it would be a source of revenue to the Hospital.

But, in the second place, if it is arranged that the cases be made available for the instruction of the students, it becomes necessary to provide a competent teacher to impart that instruction; and I feel that at present the organisation of the Hospital does not properly permit of this. Most of you are aware that the administration of the Maternity Hospital undergoes, no less than four times a year, a cataclysmic disruption. On the last days of October, January, April, and July, the entire medical staff, including the ordinary physician, the assistant physician, two resident physicians, and twelve or fourteen nurses, retire from duty; and on the following days a new ordinary physician, a new assistant physician, two new residents, and twelve or fourteen new nurses assume administrative charge. The only members who are retained are the staff nurse and her assistant.

Is it a matter for surprise that, under these conditions, the first few weeks of a quarter is a time of hourly anxiety to the ordinary physician on duty?

When one considers the untold possibilities of disaster which may spring from the inexperience of two young graduates, and the ignorance of twelve untrained nurses, one can, in a measure, realise what that anxiety is.

I cannot help thinking, and I have thought much on the matter, that the periodic disturbance of the routine of the Hospital accounts for the regrettable fact that our results are not equal to that of many Maternity Hospitals elsewhere. But how can it be otherwise? It is a physical impossibility for either the ordinary physician or the assistant associated with him to be present at every labour during these early weeks; and it is as impossible, unless one is there, to guard against the errors of inexperience, carelessness, or ignorance.

I venture to think that a simple solution of the difficulty would be found by appointing a permanent resident physician, whose duty would be to act under the direction of the members of the honorary staff, according to their service, but who in their absence would take the medical direction of the Hospital.

As each physician came on duty he would appoint a junior resident physician, and it would not be difficult to apportion the duties of these two. The senior would take the charge of the indoor cases and be responsible for their management and after treatment, while the supervision of the general outdoor practice would fall to the junior.

Further, the teaching of the students in the Hospital would form part of the duty of the senior resident. These students, living in or near the Hospital, could be summoned to every case of labour at his discretion, and every case would then be made available for the teaching of practical Midwifery.

But, more than this, we have to keep in mind that there is a large out-patient practice in connection with the Hospital, amounting to something like eight or nine hundred cases a year. Under such a scheme as this it would be the duty of the junior to visit, as far as possible, every case of labour, whether normal or abnormal, along with the students. By so doing he would contribute in no small measure to the training of the students, for not only would he aid them in recognising the occurrence of abnormalities, and in determining the proper time for interference, but he would be able to show them how to make the best of untoward circumstances in the management of labour—in fact, to conduct a labour to the best purpose, in the homes and amid the surroundings of the poor, away from the more ideal conditions and conveniences of the labour ward. By some such scheme as this, I feel that not only would the training of our students in practical Midwifery be brought to a state of comparative efficiency, but the gain to the administration of the Hospital would be enormous.

Even at this late day there may be some who would suggest that such a scheme was conceived entirely in the interest of the students, and that the real purpose of the Hospital, the succour of women in labour, was made secondary to this. It is sufficient answer to such criticism, to point out that experience has always shown that everything which tends to improve the teaching efficiency of any Hospital tends directly to the benefit of the patients treated there. It is, indeed, certain that the first thing which will enhance the value of the Maternity Hospital, as a succour for a woman in labour, is to increase its efficiency as an institution for the teaching of practical Obstetrics.

I have, I fear, presumed on your kindness, on this my last appearance as your President, and taxed your patience and forbearance; but I feel sure that there is no one here to-night who does not realise the gravity of the problem which we have to face, in discovering, at any cost, the means by which we may diminish the melancholy sacrifice of life which overshadows the practice of our art to-day. Conscious as I am of the inadequacy of the treatment, at my hands, both of the problem and its solution, I venture still to hope that the words which I have spoken, last year and to-night, with all the earnestness of which I am capable, may serve to direct the practical attention of this and similar Societies to the questions raised.

I feel sure that it is to bodies such as this, composed as these are of hospital physicians, teachers of Obstetrics, and practitioners of the obstetric art, that we must appeal, for in their hands is the key of the problem.

It is in this spirit that I venture to bring before you these suggestions towards the improvement of the teaching of Obstetrics in Edinburgh, and I am grateful for the opportunity which your kindness has given me to place my thoughts before you, however inadequate they may be to the overwhelming importance of the subject.

And may I, in the words of Milton, exorcise the ghost of despair which sometimes haunts us, seeking to paralyse us as we grapple with such problems—

> "Accuse not Nature, she hath done her part,
> Do thou but thine."

I have said that I accepted the honour of this chair with diffidence; I resign it to my successor with perfect confidence. I feel sure you have done wisely on this occasion in looking outside the ranks of specialists for your President. It is particularly appropriate that, in a Society such as ours, we should bestow our chief honour from time to time on one engaged in general practice. No one is more interested in practical Obstetrics than the general practitioner, and we must not forget that the Society was founded by a group of general practitioners, for the discussion of matters of obstetric interest arising in their several experiences.

This being so, you have found in Dr. James Ritchie one who is in all respects worthy to fill this chair. He has been for many years a Fellow of this Society, and has served it faithfully in several official capacities. He has further shown the keenest interest in our meetings, has made contributions to our debates of the greatest interest, and he has enriched our *Transactions* by papers of the utmost scientific and practical value. I venture to hope that one feature of his tenure of office will be an increased and active interest in the work of the Society, on the part of practitioners generally.

I resign this chair to Dr. Ritchie, in the full assurance that he will worthily uphold and continue its honourable traditions.

ON THE TREATMENT OF NERVOUS INDIGESTION; OR GASTRIC NEURASTHENIA.

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GASTRIC neurasthenia, aptly termed by French writers *dyspepsie nervo-motrice*, is undoubtedly the very commonest form of chronic indigestion which comes under the notice of the practitioner of medicine, and its treatment therefore a daily problem and a subject of perennial interest. The object of the present paper is to give a brief sketch of the principles which should guide us in the management of these cases, and to indicate a more scientific and rational method of treatment than the routine administration of bismuth, acids, alkalies, and pepsin, which invariably fail to relieve.

But, first of all, it is necessary that we have a clear idea of what is meant by gastric neurasthenia. It may be defined as a mixed neurosis of the stomach. We know that the nervous troubles affecting the stomach may be all classified into three groups:—

1. NEUROSES OF SENSATION.—In this group we find hyperæsthesia, sensations of pain and fulness, gastralgia, and the gastric crises of tabes.

2. NEUROSES OF SECRETION.—The HCl of the gastric juice may be in excess (hyperchlorhydria), or in defect (hypochlorhydria), or there may be continuous secretion.

3. NEUROSES OF MOTILITY.—Here we find peristaltic unrest, rumination, nervous vomiting, and muscular atony or myasthenia.

In nervous indigestion we usually have a combination of two of these groups. Most frequently we find associated hyperæsthesia and myasthenia of the first degree. In a healthy stomach the presence of food in normal amount excites absolutely no sensation. We are not aware that we have a stomach. In hyperæsthesia not only does the presence of food give rise to uneasy sensations, varying from a sense of fulness or dragging to actual pain, but even when the stomach is empty the patient may experience abnormal sensations, due to contact of its walls with each other. In such cases the sickening feeling may be immediately relieved by the ingestion of food, only to be followed by other disagreeable sensations during the digestive process.

In muscular atony or myasthenia, although the peristalsis is normal or may even be in excess, the stomach has lost, to a greater or less degree, the power of contracting upon its contents. In a normal stomach no gas can accumulate. There is no room for it, as the stomach is always full. If a pint of food is taken, the stomach is contracted tightly around it, and there is no space for anything else. If any air is swallowed or any gas liberated by the decomposition of the salts of the food, it is immediately expelled. The same thing obtains if there is only 1 oz. of food in the stomach. The stomach is contracted tightly round that ounce. But when the stomach has partially lost its muscular tone it will sag down under the weight of its contents and allow gas to accumulate within it.

As a rule, the secretory functions of the stomach are practically normal in gastric neurasthenia. We may meet with occasional departures from the normal composition of the gastric juice, but as a rule these are unimportant. It is often stated that hyperchlorhydria is a frequent complication, but I think that this is probably an error, and in these cases the pain during the height of digestion is not due to any actual increase in the amount of free hydrochloric acid, but rather to an increased sensitiveness of the stomach. The normal quantity of free hydrochloric acid causes burning pain to the sensitive stomach. In some cases, however, I have seen a great excess of hydrochloric acid.

It is important to bear in mind that this condition is not an affection of the stomach, pure and simple, but a local expression of a general neurasthenia, and is in fact the commonest manifestation of it. The patient has in all probability suffered for a long time with general neurasthenia of a mild form, but has taken little notice of the diminished capacity for mental and physical work, and the other characteristic symptoms, and it is not until to these are added the special gastric troubles that he decides to obtain medical advice. Unfortunately his symptoms are then not unfrequently misunderstood, and because his tongue is furred he is supposed to be suffering from gastric catarrh. If he is a rich man, he is sent to Carlsbad or Homburg, with disastrous results; if a poor man, he gets blue pill and black draught or a bismuth mixture.

As regards the recognition of gastric neurasthenia, we are practically justified in diagnosing it when we have excluded all organic or anatomical affections of the stomach, and in addition find the characteristic stigmata of general neurasthenia. The main signs which we shall elicit upon a physical examination of the patient, and which will confirm our diagnosis, are the following:— (1) We shall probably be able to elicit the splashing sound (*clapotement*, *Magenplätschern*) during the whole of the digestive period, but the absence of food residues from the stomach before breakfast will show that the severe form of myasthenia gastrica is absent. It is important to bear in mind that gastric splashing be absent in cases characterised by the presence of sensory neuroses only. (2) There are usually spots painful on pressure in the upper abdominal region. There is not a single one, as in ulcer, but several, and these not so acutely tender. (3) No diagnostic information is to be obtained by the chemical examination of the gastric juice. Usually there is slight hypochlorhydria, occasionally hyperchlorhydria, and often it is quite normal. (4) Gastroptosis and nephroptosis are often present, and strongly suggest neurasthenia.

The diagnosis is thus mainly to be made by a process of exclusion. We have the presence of indigestion in a patient who has evidently not gastritis, ulcer, myasthenia, nor cancer, but who evidently is a neurasthenic.

We now come to the question of rational treatment. The first thing to do in any case is to make sure that the neurasthenia does not depend upon this absorption into the system of toxines from the alimentary tract. To this end we carefully examine the mouth for the presence of necrosing and septic stumps and for pyorrhœa alveolaris. If either of these conditions be present, the patient must be sent to a dental surgeon for treatment, before the neurasthenia can be attacked with any hope of success. We examine the abdomen for retained fæcal matter in the large intestine, and the urine for indican. The presence of the latter in abnormal quantities is now held to point to the possibility of toxine absorption from the bowel. If we find evidence of chronic fæcal retention, we wash out the colon with a series of large injections (*vide* Kemp[1] and the author[2]). Having satisfied ourselves that no toxines are being absorbed, we make a careful exploration of the abdomen for gastroptosis or enteroptosis. If present, we apply a suitable bandage or belt.

Having arrived at this point, the question of diet will demand our attention.

Although, as we have seen, the study of the chemistry of the gastric secretion has very little positive value in the diagnosis of gastric neurasthenia, yet it is indispensable if we wish to treat the case in a scientific manner.

The first problem to be decided is the frequency with which meals should be given. Shall we give the patient five or six small meals a day or two large ones? The answer to this will entirely depend upon the presence or absence of gastric myasthenia. As I have pointed out elsewhere,[3] myasthenia or muscular weakness of the stomach wall may exist in three stages.

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[1] "Enteroclysis," New York, 1900, p. 64.

[2] Herschell, "Constipation," London, 1899, p. 26.

[3] *Clin. Journ.*, London, December 18, 25, 1901, January 1, 1902.

First stage.—The stomach splashes more readily than normal during the digestive period, tonic contraction is deficient, but peristalsis is practically normal. The stomach manages to empty itself before the next meal.

Second stage.—The stomach cannot empty itself before the next meal, but does so during the night, so that it is empty for a short time before breakfast.

Third stage or atonic dilatation.—The stomach cannot empty itself during the night, and thus always contains food residues.

We ascertain the presence and degree of the affection by extracting the stomach contents, before dinner and before breakfast respectively. If we find no food residues before dinner, the affection is in the first stage. That is, of course, assuming that the other signs of myasthenia are present. If we find food residues before dinner, but not before breakfast on the following morning, we have to deal with the second stage. If the stomach contains stagnating food débris, when it ought to be empty, the first thing in the morning, then there is myasthenia of the third degree. In the treatment of neurasthenia pure and simple, small and frequent meals are indicated, as we know from clinical experience that the patients usually become exhausted and require food between the ordinary meal times. Also, in myasthenia of the first and second degrees there are fortunately the same indications. The rapidity of digestion is not impaired, but the weakened stomach is unable to handle a large mass of food. So one may lay down the positive rule, that in neurasthenia, complicated with myasthenia gastrica of the first or second degree, we should order the patient five or six meals, at intervals of two or three hours during his waking day. The best plan is to give three principal meals, and between them some lighter, more easily assimilable food, such as carnigen in a little water, or plasmon and milk, or egg-flip. It will be very rare that we shall meet with a case of myasthenia of the third degree as a complication of neurasthenia. It is most common to find only the first degree without any marked delay in the peristalsis of the stomach. The diet of myasthenia of the third degree is a subject of too great a magnitude to be discussed in the limits of the present paper, complicated as it is with the question of lavage.

The object of our examination, then, is to exclude myasthenia retention. If we can do this we may safely give the frequent small meals which we know are, as a rule, best for neurasthenia.

The next point to ascertain is, whether the food shall contain a preponderance of proteid or of farinaceous material. To this end we administer to the patient an Ewald test breakfast, consisting of dry bread and water, and examine the contents of the stomach one hour afterwards. We need only examine for hydrochloric acid. We first of all test with blue litmus paper. If it does not redden we need proceed no further, as we shall have ascertained all that we require, namely, that there is no acid present of any kind. If, however, as will usually happen, we obtain the reaction, we had better proceed to test for free HCl at once with Gunzberg's test. As we have excluded the third stage of myasthenia, and we know that the stomach does not contain any fermenting food residues before breakfast, there cannot possibly be much lactic acid one hour after the Ewald test-breakfast. Therefore any free acid present must be hydrochloric. We will suppose that we get the characteristic crimson reaction with the phloroglucin vanillin test, showing that free HCl is present. The next step is to ascertain its quantity. This we do with quite sufficient accuracy by tritrating with a decinormal solution of sodium hydrate, using dimethyl-amido-azo-benzol as an indicator. Deducting the result from the total acidity, as determined with phenol-phthalein as an indicator, we get roughly the combined HCl.

We find the Hydrochloric Acid is in Excess.—In this case we have several indications—

1. We must give a food which has a high combining value with hydrochloric acid. We must do this to protect the stomach from the irritating effects of the excess of acid. The pain of hyperchlorhydria is at once relieved by raw eggs or milk. But we must avoid giving such food as will excite the gastric glands to a fresh secretion of hydrochloric acid. We are therefore in rather a dilemma, as recent experiments have shown us that the stomach is very sensible, and secretes a gastric juice absolutely fitted, in quantity and quality, for the particular work it has to do. For instance, if we introduce bread into a normal stomach, a gastric juice, poor in HCl and admirably fitted to digest that article of food, will be secreted. If, on the other hand, we put into the stomach a mutton chop, a gastric juice, rich in pepsin and containing a relative excess of HCl, will be at once poured out. So that, if we give in a case of hyperchlorhydria a proteid diet, which has a high combining power for the free acid, we run the risk of stimulating a further secretion of the very substance we are attempting to neutralise. But, under these circumstances, we must do the best we can, and, fortunately, there are several food stuffs which, whilst having a high combining value to HCl, yet stimulate the secretion of it much less than red butcher's meat. These are—sweetbreads, calves' brains, oysters, albumin of eggs, plasmon, and milk.

2. We know that HCl in excess inhibits the digestion of starch, which was begun in the mouth by the ptyalin of the saliva. It is obvious that we must—(*a*) Limit the amount of starchy food. (*b*) Convert as much of it as we can into dextrin. We toast our bread, and give converted starch, such as grape nuts or Mellin's food. (*c*) We give with the starchy food a diastatic ferment, such as malt extract (choosing the liquid ones, such as

bynin), taka-diastase, or infusion of malt, as recommended by Roberts.[1]

We find the Hydrochloric Acid Normal or Deficient.—In such a case we should prescribe such a diet as the following:—

Breakfast.—Cold boiled bacon, toast, one egg; towards the end of the meal, one small cup of cocoa. Fresh butter *ad libitum.*

Lunch.—Any white meat, or fish or poultry or bird; green vegetables in the form of a purée; stale bread or toast. One glass of water towards the end of the meal.

Tea-time.—A cup of Mellin's food or a glass of milk and soda-water.

Dinner.—Fish; butcher's meat, roast, grilled, or boiled, especially lamb, hare, tender beef, and tripe; purée of vegetables; baked apples or stewed fruit, baked custard pudding; toast or bread. One glass of water towards the end of the meal.

If desired, a little spirit may be added to the water at lunch and dinner. The main point is to induce the patient to take a sufficient amount of easily digested fat, and to limit the amount of fluid taken with the meal. An hour before any meal, the patient may take as much water as he likes to drink. No soup, entrées, or nuts, cheese, or pastry, are to be allowed.

In gastric neurasthenia all food of every kind will cause discomfort, and most patients will already have reduced their diet to far below that required for the needs of the organism, in the vain attempt to find a diet upon which they can live with comfort; and naturally, in doing so, they have increased the gastric trouble, as the stomach will participate in the general tissue starvation. It is well, therefore, to explain this to the patient, and put him at once upon a diet which is adequate to support life, and insist upon it being taken, however much discomfort it causes.

Medicine.—After adjusting the diet, the first point to which we must direct our attention is the condition of the bowels. Constipation is the rule. We must remember that, in gastric neurasthenia, the most frequent cause of this condition is local spasm of the bowel. This is best treated, according to the method of Fleiner, with systematic injection of warm olive-oil at bed-time. Small doses of cascara with hyoscyamus and taraxacum may be given at night, if spasm be not present. The following pill is one of the best I know for habitual use as a laxative, when it is required to act gently upon the liver:—

℞ Ext. col. co., 1½ gr.; Ext. rhœi, 1½ gr.; Pil. hydrarg., 1 gr.; Pulv. ipecac., ⅕ gr.; Sapon. alb., ⅓ gr.; Ol. caryophyll., ⅓ minim. *M. Ft.* pil. 1.—*To be taken at bedtime.*

Undoubtedly the most valuable drug in the treatment of gastric neurasthenia is nitrate of silver. It both acts as an astringent, diminishes abnormal irritability of the nerves of the stomach, and is a tonic to the nervous system. It is best administered in the dose of ¼ gr., in palatinoid form, made, at my suggestion, by Oppenheimer. In these it is diluted with a vegetable inert powder, and the well-known difficulty with the excipient avoided. One palatinoid may be given three times a day, upon an empty stomach, for three weeks. It must then be discontinued for a time. Another valuable drug is quinine bisulphate, which is conveniently given dissolved in a teaspoonful of tincture of condurango, or in the form of a tabloid. Not more than ½ gr. of quinine should be given for a dose. Red marrow of bones is also invaluable in the treatment of gastric neurasthenia, and may be given in the form of Armour's glycerin extract.

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[1] "Digestion and Diet," London, 1891, p. 224.

With these exceptions, I do not think that drugs are of much use in gastric neurasthenia. Phosphates, glycero-phosphates, hypophosphites, phosphorus, zinc, bromides, have all practically failed in my hands, and, I think, in those of most other physicians, to benefit, permanently, cases of true neurasthenia.

PHYSICAL MEANS OF RESTORING TONE TO THE SYSTEM.—We have at our command two extremely valuable methods of toning up an exhausted nervous system—static electricity and the sinusoidal bath.

Static electricity was really the oldest form of the electric current to be employed as a therapeutic agent, and was used extensively in the last century at Guy's Hospital by Golding Bird,[1] Addison,[2] Gull,[3] and Wilks.[4]

Several factors combined to cause static electricity to pass out of use as a means of treating disease. Chief of these was the imperfections in the machines themselves. Any humidity in the atmosphere, or fog, would cause the machine of the day to cease production, and the physician would be left in the lurch with a patient on hand whom he was unable to treat. Moreover, in those days there were no electric motors, and machines had to be actuated by hand; and, from their construction, the output of electricity was not sufficient to produce any considerable therapeutic effect without the assistance of condensers or Leyden jars. It was really not until Wimshurst invented his electrical machine that an apparatus came into existence which would work under all conditions of the atmosphere. Since that date, in America, most excellent and earnest work has been done by Bartholow, Ramsay, Morton, Beard, and Monell; in France, by Arthuis, Charcot and Vigouroux, Guimbail, and others; and in England, by M'Clure. And the application of static electricity has assumed the position which it merits in the armamentarium of those who have to do largely with the treatment of diseases of the nervous system. In America the Holz machine has been brought to a very high degree of perfection by Van Houten and several other manufacturers. In Paris the form favoured is the Wimshurst, with plates revolving in opposite directions, but without sectors, and much improved, especially by Gaiffe and Bonetti. Any of these machines of the large size will give a 12-inch spark, and illumine with perfect efficiency a Crookes' tube for X-ray work.

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[1] *Guy's Hosp. Rep.*, London, 1831, vol. v.

[2] *Ibid.*, 1841, vol. xii.

[3] *Ibid.*, 1841.

[4] *Ibid.*, 1873.

It would be, of course, impossible in the limits of the present paper to give even a slight sketch of the application of static electricity, and I must refer my readers to the works of Professor Monell.[1]

As the result of numerous observations made by Guimbail, Dignat, de la Touche, Vigouroux, and others, it has been well established that one of the most constant effects of the static bath is to lower the blood pressure. And as in the great majority of neurasthenics we find an exaggerated arterial tension, we should naturally expect benefit from its use. Clinical experience has shown this to be the case, and especially so with regard to two very common symptoms in neurasthenia,—insomnia and pain. Indeed, Apostoli and Planet have used it with such success in cases of neurasthenic gastralgia,[2] that they have actually suggested its use as a means of making a differential diagnosis between that affection and the gastric crises of tabes, which are not relieved by it.

In fact, static electricity appears to be one of the best general sedative tonics which we have at our disposal, and has one very great advantage over most other forms of electricity, that it can be applied to the patient without the necessity for him to disrobe.

The form of application which gives the best results in gastric neurasthenia are the positive static bath[3] and potential alternation.[4]

In the cases of neurasthenia in which the blood pressure is lowered, we find better results from the use of the direct application of the alternating currents of high frequency produced by the aid of an Oudin's resonator, or the use of the sinusoidal bath. As the high frequency apparatus is not yet in general use, I shall limit my description to the latter.

THE SINUSOIDAL BATH.—The use of the hydro-electric bath appears to date back into far antiquity. There is a tradition, according to Guimbail, that ten centuries ago South African mothers used to bathe their afflicted children in ponds which contained the *Gymnotus*, or electric eel; and the same author states that in ancient Rome the physicians of the day used to treat cases of gout in the same way. It is quite certain that the galvanic bath was used in the treatment of disease as early as the middle of the eighteenth century. The faradic bath was apparently introduced into medical practice soon after Duchenne produced his classical work, "Electrisation localisée." The sinusoidal bath may be given either direct from the alternating electric light mains, or from small dynamos specially constructed for the purpose. If given in the former manner, a suitable transformer will have to be used, by which the pressure of the current is reduced to 6 or 8 volts, and special precautions will have to be taken that the bath is thoroughly insulated from the earth. In careful and competent hands the current given from the main is perfectly safe; but because accidents are possible, I strongly advise the use, in preference, of a machine which has been so constructed that it cannot by any possibility give a dangerous current. Another great advantage of the latter method lies in the fact that, as it is actuated by a primary or secondary battery, it can be used at the house of a patient which has not the electric light laid on. No one should dream of giving a bath from the alternating electric circuit before carefully reading Dr. Hedley's admirable little book on the use of electric currents from the main. Of the machines for producing a sinusoidal current, suitable for hydro-electric baths, there are two types:—

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[1] "A Manual of Static Electricity," New York, 1900; "Elements of Correct Technique," New York, 1900.

[2] *Soc. franc. d'elect.*, November 1898.

[3] Monell, *op. cit.*, p. 59.

[4] Monell, *op. cit.*, p. 58.

1. That manufactured by the M'Intosh Battery and Optical Company of Chicago. This is really an improved pattern of the old magneto-electric machine, and consists essentially of a permanent horse-shoe magnet, between the poles of which revolves a ring-shaped armature. 2. An ordinary direct current motor, with electro-magnetic poles.

In each case the armature is tapped at equal points and connected to slip rings upon the axis. From the brushes which are in electrical contact with these rings, a true sinusoidal current may be obtained, and the period and voltage decided by the speed of the machine. The machine may be obviously driven by a pulley or by a few secondary battery cells. Such a machine is manufactured by A. Dean, 73 Hatton Garden, London, W.C., especially for medical work. So much for the source of our current. In order to give a bath we shall require some additional apparatus. These are—

The electrodes for use in the bath.—These can be easily manufactured in the following manner. Procure two wicker fire-screens, such as are made to hang upon the back of chairs. Make two bags of coarse canvas, about 18 in. × 12 in., open at one end. Sew with string one of the bags upon the back of each of the screens with the open end upwards. Now get the ironmonger to cut two pieces of sheet copper or zinc, 11 in. × 17 in., and solder to the centre of one of the short sides of each a yard of thick copper wire. To the free extremity of each of these wires you must have soldered an ordinary brass screw terminal. You are now in possession of a much better pair of electrodes than it is possible to purchase anywhere. In using them you will place the metal plate in the canvas bag on the back of the screen, and stand one up at each end of the bath. The patient's back will rest against one screen, and his feet against the other, and as, when immersed in water, the wicker will become quite pliable, the comfort to the patient will be much greater than when the ordinary expensive bath electrodes of the shops are made use of.

Rheophores or connecting wires. — We shall require several yards of ordinary guttapercha covered bell wire, with which to make the several connections. We shall require a set of accumulators giving off 12 volts to run the sinusoidal machine.

Rheostats.—We shall require two—one in the circuit between the accumulators and the sinusoidal machine, to regulate the E.M.F. of the current supplied to it, and consequently its speed; and we shall also require one between the machine and one of the bath electrodes, to regulate the current strength in the bath.

METHOD OF GIVING THE BATH.—The apparatus having been placed upon a small table alongside the bath, the accumulators upon the floor, and the electrodes in the bath, which contains just sufficient warm water to cover the patient when he is lying at full length in it, the connections are made according to the following scheme:—

The two terminals of the accumulator are connected, by means of lengths of guttapercha covered wire, with afferent terminals of the sinusoidal machine. One of these wires is divided, and a rheostat B placed in the gap. From the efferent terminals of the sinusoidal machine similar wires lead to the electrodes in the bath. One of these wires is similarly divided, and rheostat D interposed.

The sinusoidal machine is now set in motion, the rheostat B having been so adjusted as to cause a moderate number of revolutions a minute. The next thing to do is to test the amount of current passing through the bath. Adjust the rheostat D with the slider close to the weakest end, and place the forefinger of each hand in contact in the centre of the bath. Slowly separate the two fingers, moving the hands away from each other. You possibly will feel nothing. Now move the slider of the rheostat a little nearer the strong end, and try again. Continue thus to move the slider of the rheostat until you can just feel a slight current. This current will be a little more than the patient should have for a commencement, so you move the rheostat half an inch or so back. The patient may now enter the bath and lie down. The duration of the first bath should be about five minutes, and from day to day you may increase the time that the patient remains in the bath, according to the effect produced. It is important to bear in mind that the most valuable effects of the sinusoidal bath are produced by currents which are almost imperceptible to the patient. The sinusoidal current has a very valuable action upon the metabolism of the body, and is one of the best general tonics known. It raises the amount of urea excreted, and increases the amount of carbonic acid exhaled by nearly one half.

Local Treatment to the Stomach.—We may require local treatment to the interior of the stomach—(*a*) To relieve pain; (*b*) to diminish an excessive secretion of HCl; (*c*) to increase appetite; (*d*) to stimulate the secretion of the digestive ferments.

(*a*) *To relieve pain.*—We may apply solutions of menthol or cocaine to the interior of the stomach with Einhorn's intragastric spray apparatus. This is constructed on the same principle as the familiar scent spray, and will project a very fine cloud from the extremity of a tube resembling a stomach tube in size and shape. The advantage of using this apparatus over giving the drug by the mouth, is mainly that we can apply a very small amount of a concentrated solution over a large area of the stomach. In other words, it enables us to apply a strong enough solution of the drug to the interior of the stomach to relieve the pain without poisoning the patient.

(*b*) *To diminish excessive secretion of hydrochloric acid, or hyperchlorhydria.*—This condition is not unfrequently met with in gastric neurasthenia as a very troublesome and distressing complication. And in other cases where the absolute amount of free HCl may not be really in excess, the stomach is hyperæsthetic, and distress is experienced as soon as free HCl commences to make its appearance during the digestive process. Fortunately the same treatment is efficacious in both these conditions. The methods at our disposal for treating are two—the intragastric spray of nitrate of silver, and the application of a high tension electric current from a high tension induction coil apparatus by means of an intragastric electrode. As suggested by Einhorn, these methods of treatment may be usefully employed upon alternate days.

(*c*) *To increase appetite.*—In cases attended with persistent anorexia, we may with advantage spray the stomach with infusion of gentian, quassia, or hops. Gentian is the best if there is any hyperchlorhydria or catarrh, as it is the most astringent of the three.

(*d*) *To stimulate the digestive ferments.*—From the fact that the digestive ferments pepsin and rennin are not secreted as such, but as an inactive proenzyme, which only becomes converted into the ferment after being acted on by HCl, it has been suggested that in cases of diminished peptic activity of the gastric juice, advantage would be probably gained by spraying the stomach with that drug. In my hands it certainly has given good results, and I strongly advise it as a routine method of treatment in all cases where it appears, from an analysis of the gastric contents, that pepsin or rennin are deficient. The operation should be performed shortly before each meal. I do not think that equally good results are obtained by giving the hydrochloric acid by the mouth in the form of a draught. As in the case of cocaine a much larger quantity than is good for the patient would be required.

THE PROPOSED REORGANISATION OF THE MEDICAL CURRICULUM.

By Archibald Stodart Walker, M.B., F.R.C.P.Ed.

There were many difficulties in the way of an adequate discussion taking place on Dr. Richard Berry's motion relating to Curriculum Reform, at the recent meeting of the General Medical Council. Many of these difficulties are obvious, and to specify others might appear invidious. Accordingly, I have had recourse to the pages of the Journal in which the scheme, as elaborated by Dr. Berry at the Council meeting, was originally submitted for the approval of those interested in University reform. Any remarks made by the present writer may perhaps be distinctive, from the fact that, although he can claim some fifteen years' experience of the working of the medical curricula associated with the University, yet in his present position, as seceded from the active ranks of the profession, he has neither logs to roll nor axes to grind.

No one, in studying Dr. Berry's elaborated structure, can fail to be struck with both the earnestness and the sincerity of the architect, even though occasionally his irresistible humour plays havoc with the design, and draws the attention away from the maturity of the judgment to the nimbleness of the wit. And, on the whole, Dr. Berry has been responsible for more than a mere *tour de force*. He is really the author of a project, upon the foundation of which, unless I am grievously mistaken, the eventual curriculum will be built. But, in saying this much, we must not shut our eyes to the fact that, from a certain point of view, there are grave fallacies associated with his scheme, and that while the chief effort of the distinguished anatomist has been to get rid of anachronisms, he has not been guiltless of allowing his project to be saddled by conditions which are more dangerous and which seem to undermine much of the sanity of the scheme. Let me indicate more precisely what I mean.

In his consideration of the preliminary scientific work which is to fall to the lot of the student, Dr. Berry says: "The enormous advances made in these recent years in Medicine, Surgery, Physiology, and Pathology, absolutely demand more time being devoted to their study. This can only be attained either by lengthening an already sufficiently long course, or by cutting down some of the more unnecessary parts of the course. It seems decidedly advantageous to adopt the latter method, which has accordingly been done. Consequently, three months only has been allotted to the preliminary scientific work." Now, if an author's preface can damn a book, this statement surely holds Dr. Berry's scheme in jeopardy. For surely the anatomist has not become so absorbed in his merely mechanical pursuits to forget that a not inconsiderable accurate knowledge of Chemistry, Physics, and Biology is the bed-rock of the physician. Whether we have in view the general practitioner, the physician specifically considered, the experimental physiologist, or the mere diagnostician, we do not hesitate to affirm that nothing shatters the confidence more, nothing accentuates the incompetence of judging, than an insufficient knowledge of the primary subjects we are considering. Surely in a University, which is far more than a school of works, or a cramming machine, it is infinitely wiser to instil the essential *principles* of Chemistry, Physics, and Biology, than to go out of the way to profess to teach all the *facts* associated with what Dr. Berry calls "the enormous advances made in Medicine, Surgery, Physiology, and Pathology." Perhaps the anatomist is thinking chiefly of the art of Surgery when he makes his contention, an art which in the majority of cases is referred to a specialist; but when we, on the other hand, take into consideration the practitioner of medicine, we appeal to all teachers and professors of the healing art for a corroboration of the statement, that it is far better to start the practice of medicine with a thorough understanding of scientific principles, an ever-present help in time of trouble, than to go loaded with facts drifting on our memory without the rudder of principle or the pilot of law. Dr. Berry may attempt to beg his subject by handicapping Chemistry at the baptismal font by christening it "sleep inducing." The man who is to count at all in the great profession to which he aspires, will have to fight much more powerful narcotics than Chemistry before he handles his official parchment. He may indeed require many pin-pricks, even when studying the marvellous possibilities of the base of the skull or the muscles of the back.

I would also like to indicate to Dr. Berry that I view with becoming reverence the word "English" which occurs on occasion in his lucid article, for I hope I am not sympathetic with mere parochial methods, but I also remember upon what basis the great reputation of the "Scottish" schools rests. He himself admitted, at the meeting of the General Council, that our first claim to greatness lay in the teaching of Medicine and Clinical Medicine. And why is this so? Simply because the Scottish teaching is run upon philosophical lines, upon which the student, approaching the consideration of his studies, is referred back to principles and analogies and to the sciences which lie at the basis of etiology, diagnosis, prognosis, and therapeusis. Even when some of our teachers lead us into the areas of speculation, and often tremble on the edge of metaphysics, we recognise simply an extreme reflection of the tendencies and methods of the school we are associated with. For in the pursuit of the philosophical methods indicated, the teacher and student must fall back continually on Biology, the science of life; on Physics, the philosophy of nature; on Chemistry, the science which investigates and the laws which regulate the elements and their combinations. I grant that, in the early stage of medical study, the average student may deem these matters superfluous and irksome, but unless he approaches them with earnestness and persistency of purpose, he will of a certainty some day find himself hopelessly adrift, and be found labelling himself, in the bitterness of his heart, a mere empiricist. I would then urge the necessity, not of curtailing this part of the curriculum, but of extending it, with the rider that an attempt be made by the teachers of these subjects to put before the student a perspective of the country before him, and to indicate the relations of the special subject under discussion to the general question of medical study—in Biology, by more than an indication of the essential principles underlying the conduct of life, including a careful study of the deeper meanings of such terms as heredity, differentiation, telegony, survival of the fit, atavism, developmental residue, acquired character, recedivism, and the like; in Chemistry, by an indication of the relation of inorganic and organic chemistry to physiological action, to be discussed later in a special class; and in Physics, by an application of laws under discussion to their anatomical and physiological claims.

That I do not wish to unduly disparage the empirical methods of teaching, will be seen when I again part company with Dr. Berry on another question of vital importance, namely, that of hospital attendance. And in adopting this attitude, I am quite aware that I make my position more isolated than ever, and that whatever friends I may have started with, or picked up on the way in the early part of my journey, I am likely to lose. For I hold that not only should the medical student be encouraged to attend hospital practice in his second year, but that he be advised and permitted to attend the Royal Infirmary at the very outset of his undergraduate days. I am quite willing to grant that to attempt to teach Surgery to a man who knows nothing of Anatomy and Pathology is of the nature of an anachronism, and to the teacher of the nature of an injustice; yet I am as equally convinced of the necessity of allowing the medical child an early opportunity of coming in contact with an environment of practical medicine and surgery. The infant learns his primary steps of language, long before he understands what grammar means, and in the same way it is of infinite value to the medical student that he be allowed to use his eyes and ears in a sort of probational period of his studies. In this early stage he has simply to look and to hear. He is not to use his tongue or his hands; he is not to be questioned, or to meddle in a practical way with the patients. Out of the heterogeneity of his experience he will evolve a homogeneity, out of chaos will spring cosmos; and when he comes to take a systematic and practical interest in the work of the Hospital, he will have laid the foundation of a considerable experience of methods and results, which will place him at a considerable advantage over men who approach their systematic clinical work, deeply learned in the anatomical, physiological, and pathological philosophy, yet completely ignorant of the methods of the workshop in which they are called upon to take an active assistantship. In Surgery, under the scheme I suggest, we will then have the surgeon evolved thus—(1) Probationer, (2) dresser, (3) clerk, (4) clinical assistant, (5) resident surgeon, (6) assistant surgeon, (7) surgeon.

When Dr. Berry says: "Having passed in Anatomy, Physiology, and Pathology, the soil is now ripe for the sowing of the surgical seed, with some reasonable hope that it will not fall among tares and be swallowed up in the weedy growths of Chemistry and Physics," I must say I fail to grasp the aptitude of the metaphor, for I do not suspect that any trained taxonomist would accept the classification of Chemistry and Physics as belonging to the weed tribe. It is this tendency to sacrilegious assault on the foundations of the higher teaching that often deprives Dr. Berry's well-meaning efforts of their legitimate value. A half-concealed sneer and a picturesque metaphor are not sufficiently lethal weapons with which to destroy the vitality of Physics and Chemistry in the economy of the medical curriculum.

Of the rest of the scheme, as conceived by Dr. Berry and delivered at the meeting of the General Council of the University, under the obstetrical auspices of the Pathological Club, I have little to say but praise, with perhaps a sceptical note as to the amount of time proportioned to the study of Anatomy. I hesitated in tacking on this addendum to my remarks, in case the distinguished anatomist we have been indirectly concerned with, might suspect the *argumentum ad hominem.* But Dr. Berry will recall the lines of Cicero—"Nam ut quisque est vir optimus, ita difficillime esse alios improbos suspicatur."

THE PRACTICAL APPLICATION OF THE COMBINED OPERATIONS OF INTERNAL AND EXTERNAL URETHROTOMY.

By REGINALD HARRISON, F.R.C.S., *Surgeon St. Peter's Hospital, London.*

IN this Journal, June 1875, an interesting communication will be found from Professor Annandale, advocating the combination of internal with external urethrotomy for various surgical purposes connected with disorders of the urethra and bladder. Ten years afterwards,[1] I proposed a somewhat similar proceeding, without knowing that my friend had anticipated me, and I thus omitted to acknowledge our obligations to him for this important communication. As, notwithstanding our united efforts, this procedure does not appear to be sufficiently known, and can hardly be said to have found a place in our text-books, I would venture to refer to it again, and to offer illustrations of its application. It has much to recommend it, both theoretically and practically, for, as Keyes[1] remarks, it commends itself "to common sense."

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[1] *Brit. Med. Journ.*, London, July 18, 1885.

I will describe, in the first place, my own method, for, though this does not differ in principle from that of Professor Annandale, there are a few details which I may best deal with in this way.

I will take, for the purpose of illustration, a severe and dangerous form of sudden extravasation of urine from an old stricture in the deep urethra, where the urine has been forced from the perineum into the scrotum and lower portions of the abdominal parietes, flanks, and buttocks, where mortification and inflammation of the parts involved are impending. If there has been much delay in affording ample surgical relief, the tongue is becoming dry and brown, and sepsis is indicated.

During my association with two large general hospitals in Liverpool, instances of acute and extensive extravasation of urine were frequently met with, as patients were often brought ashore from sailing-ships (without doctors) practically untreated. Thus I was able to map out an almost uniform plan of procedure in these cases, which has continued to give excellent results.

Further, it is necessary to bear in mind the remote effects sometimes following extravasation and sloughing of the parts. I have recently had considerable trouble in remedying, by a plastic operation, the adhesion of a portion of the dorsum of the penis to the abdominal wall, which might, I think, have been avoided in the first instance had this contingency been foreseen.

It must never be lost sight of, however clumsy and violent the process may appear, that suppuration in connection with a stricture, and subsequent extravasation of urine, and tissue destruction, is nature's way, short of a sudden rupture without warning, for getting rid of so dangerous a compound as urine may prove when it is pent up by a stricture or obstacle, even within the limits of its natural barriers. It may be difficult to recognise a conservative process in the midst of such signs of destruction, yet instances may be recited where it resulted in the saving of life at the expense of tissue, and the formation of new vents or channels for the urine, though occasionally in inconvenient places.

I remember, in the case of a well-known traveller, an illustration of this. He was the subject of an old traumatic stricture. When in the bush, attended by his only servant, hundreds of miles away from any medical attendance, he was seized with retention, and went through the process of an acute and extensive extravasation, and subsequently the formation of several urinary fistulæ, absolutely unattended, except so far as primitive nourishment, cleanliness, fresh air, and indomitable pluck were concerned, and devotion on the part of his servant. He is still alive and in good health, his life having been saved undoubtedly by what may very properly be considered as a series of catastrophes.

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[1] "Diseases of the Urinary Organs," New York, 1885.

There is a general agreement that, in the treatment of these cases, at least two main objects should be kept in view—first, to secure a free and direct escape for the entire contents of the bladder; and, secondly, to provide in a similar way for the urine that is extravasated and confined.

I will proceed to describe how, in a case of stricture and extravasation, these two objects may be attained. The patient being anæsthetised, the internal urethrotomy should be first proceeded with. It makes all the difference if the second part of the operation, namely, the external urethrotomy and the insertion of the drainage tube, can be carried out on a grooved staff of ample dimensions. It is my object, therefore, to secure this end by the use of Maisonneuve's urethrotome, which I prefer for this purpose. The flexible guide is first passed, the director follows, and the knife, being run along in its groove, makes the section of the stricture, and so the first step of the operation is completed. It rarely happens that this cannot be accomplished, the bladder pressure being taken off the stricture by the extravasation that has happened. A large median-grooved staff is now passed into the bladder, and an external urethrotomy performed, the incision being of sufficient size to permit the passage of a full-sized perineal drainage tube; the opening of the tube should be made as near as possible to the junction of the membranous with the prostatic urethra, as in Cock's operation. The drainage tube should precisely fit the perineal wound. When this is secured, there is no side leakage of blood or urine, and, what is of even greater importance, no burrowing of the latter through the interspaces made by the extravasated urine. This is essential for the speedy healing of any fistulæ that suppuration or extravasation may have caused.

Prior to 1878, and before I had adopted and given my support in this country to Bigelow's operation of litholapaxy, I was using these drainage tubes, and closing perineal lithotomy wounds around them by deep and superficial sutures, with the objects of preventing any serious hæmorrhage occurring, of keeping patients dry by carrying urine outside the bed, and promoting the speedier healing of the wound. Thus the risks connected with these operations for stone were importantly minimised.

For some years I have used, for the second stages of perineal control drainage (with the object of getting the patient up and about as soon as possible), the rubber tubes with a tap, which were first brought under notice by Professor Annandale. They should fit the wound in each case, and are substituted for the rigid gum-elastic ones, when the latter are removed at the expiry of three or four days from the operation, and when the risk of bleeding is unlikely.

Having thus secured a free and direct escape for the urine from the bladder, the next step is to deal with the entire area of extravasated urine. The scrotum is usually enormously swollen and tense. The incisions here should, as far as possible, be confined to one or more, made on either side of the median raphe, according to circumstances. This secures a freer vent for the extravasated urine than an incision along the middle line would do. The incisions should be ample, both in length and depth, extending well into the cellular tissue.

Much of the confined urine in this situation may be squeezed out through the wounds, the surgeon using his hands as if he were dealing with a wet sponge. Thus the scrotum may rapidly be reduced to almost normal dimensions and much sloughing averted. Similarly, the abdominal parietes may be dealt with, wherever urine appears to have been extravasated.

Care should be taken to avoid making incisions in inconvenient places, as I have already instanced. The perineal tubes should be retained for from ten to fourteen days, and the urethra treated subsequently, as after perineal section for stricture, by the passage of full-sized "whips" or ordinary bougies, until healing has occurred daily or every other day, and then at gradually lengthening intervals.

I have referred to the use of "whips" in the management of these and other cases complicated with stricture. Some may never have heard of these instruments, and yet I can hardly understand how a surgeon can undertake the treatment of all strictures without being provided with them. The name was given to them eighteen years ago by the late Mr. Lund of Manchester, when I first described them.[1] I seldom employ anything else. Their length (24 in.), pliability, and shape enable them to dilate a stricture, however narrow, by a single introduction, so that there is no chance of losing the way in a difficult case when once found. Their more general use has largely diminished the number of what are called impassable, or, as I have heard them termed, "incorrigible" strictures. I have recently had some of them made with a groove (channelled whips), which answer the purpose of a catheter as well as a dilator, and may, on an emergency, act as a guide to the urethra, as in dealing with a perineal abscess or performing a perineal section. A flexible bougie will sometimes pass where a metal staff fails.

These, then, are the points I wish to give prominence to in the application of the combined urethrotomies to cases of stricture, complicated with acute extravasation of urine. The subsequent management of these cases does not require comment.

Where the first part of the proceeding cannot be carried out, because the stricture is found to be impassable to instruments, relief must be afforded by endeavouring to reach the bladder by a perineal incision, such as is practised in Cock's operation. This is by no means easy, as the bladder is now usually empty, and the perineum enormously swollen. Still, the difficulty is not an insuperable one, and the surgeon is justified in undertaking it in such circumstances, as there is but little chance of the patient doing well without the escape for the urine from the bladder being promptly rendered direct and free.

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[1] *Lancet*, London, February 3, 1883.

Seldom, however, will it be necessary to resort to such an expedient, as the chances of introducing an instrument into the bladder are greatly in the favour of the operator, when the patient is anæsthetised, and the urethra freed from tension by reason of the extravasation that has occurred. The introduction of the gum-elastic drainage tube is a necessity, which, when accomplished, at once simplifies the remainder of the process. I have met with a good many cases where this was not done at all, or was done too late, reliance being placed upon the incisions which were originally made to give exit to the extravasated urine, wherever this might be apparent. Instances are not uncommon where, for want of this, extravasation continued up to death, the urine only partially escaping through the scrotal and other side openings which may have been made surgically or by nature, and which had become blocked with pus and sloughs. Post-mortem examination not unfrequently showed that the latter openings had no direct connection with the urethra or bladder. In this way the high temperature, rigors, and a dry tongue were explained.

To take another illustration. The combined urethrotomies probably represent the safest and most efficient means of treating some forms of urethral stricture unfitted for dilatation, as measured by immediate and remote results. The chief objections to internal urethrotomy arise from the fact that, by reason of the construction of the wound, the liability to rigors and urinary fever is considerable. In a few instances the fever has been sufficient to cause death, marked by more or less suppression of urine. I do not think I ever observed either the one or the other following an external urethrotomy with drainage.

Further, a wound which is submitted to the latter process, whether it be for a lithotomy or for a strictured or ruptured urethra, is disposed to heal much more kindly and to leave behind a less contractile scar than would otherwise follow.

These conclusions were arrived at from observing what followed the treatment of accidental rupture of the urethra, caused by violence applied to the perineum, in a considerable number of cases.

As a rule, these ruptures, which were treated by a retained catheter only, were almost invariably followed by rigors and fever—sometimes of a serious nature—a fever which did not abate until the perineum and lacerated urethra were freely opened and drained.

Again, there were important differences in the scar tissue which resulted; in the one case it was soft and pliable, and in the other, dense and contractile.

In compiling my report to the International Congress of Medicine (Paris, 1900) "On Wounds relative to the Strictured Urethra," after a long series of investigations bearing upon this point, the following conclusion, amongst others, was strongly impressed on my mind: "That there is direct evidence to show that the tendency to recontraction and recurrence of stricture, after internal urethrotomy, is largely diminished by concurrent employment of systematic and efficient urine and wound drainage, such as its combination with external urethrotomy or perineal puncture affords."

The practical surgeon will probably see, on thinking this subject over, other directions where this principle of combination may be advantageously applied. Cases of urinary fistulæ complicated with stricture may, for instance, be mentioned.

A CLINICAL LECTURE ON TUBERCULOSIS OF THE BLADDER.[1]

By P. J. Freyer, M.A., M.D., M.Ch., *Surgeon to St. Peter's Hospital for Stone and Urinary Diseases, London.*

Case.—This is a male patient, æt. 29, a glass-blower by occupation, who has for three years, off and on, suffered from hæmaturia, which was the earliest symptom noticed. The hæmaturia was slight at first, the urine being merely tinged with blood for two or three days at a time, with intervals of weeks or months during which his water was quite clear. During the last three months, however, he has had seven or eight attacks of rather profuse bleeding, the urine being coloured bright red, and clots of blood being expelled. At the end of micturition a few drops of pure bright blood are passed. These attacks occur at periods of a week or ten days, the urine clearing up in the intervals. Exercise does not seem to aggravate this symptom; indeed, it occurs usually on getting out of bed in the morning.

Some months after the hæmaturia set in, he began to be troubled by increased frequency of micturition, which has gradually grown worse, till he now passes urine every half-hour or so by day, and has to get out of bed seven or eight times at night.

The flow of urine is intermittent—that is to say, after the patient has passed an ounce or two the stream stops involuntarily, to go on again after a few minutes, this phenomenon repeating itself several times before the bladder is completely emptied. At the termination of micturition there is much straining, to get rid of an imaginary residue.

Micturition is accompanied by pain, which is present before, during, and for a few minutes after the act. This pain is most severe at the end of the penis behind the glans, like the pain attending stone in the bladder; but there is also an undefined pain, or rather sense of scalding, along the urethra, in the perineum, and even in the anus. Before the act of micturition, when the bladder is at all distended, there is a dull aching pain above the pubes. The pain did not set in for about a year after the commencement of the hæmaturia, which was at first of a painless character.

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[1] Delivered at the Medical Graduates' College, London.

The urine is at present faintly alkaline, almost neutral, slightly turbid, containing a little pus and mucus, which give it a flocculent appearance, and do not readily fall to the bottom of the glass. On settling down after some hours, the deposit forms a thick, tenacious mass, which does not disperse when the vessel is shaken, but moves about in an irregular globular mass. I particularly invite your attention to these features, which are very characteristic of tuberculous urine. The specific gravity is 1022; albumin is, of course, present from the pus; but there are no blood corpuscles visible at present. The urine has been examined for tubercle bacilli, but none have at present been discovered.

The patient's father and mother died of consumption, but he has seven brothers and sisters all alive and apparently in good health. He himself is pale and thin, and latterly has been losing flesh, but he has no cough, and there is no evidence of tubercle outside of the bladder. There are no indications of tubercle in the genital organs—testes, epididymis, vesiculæ seminales, and prostate; and there is no pain, tenderness, or enlargement of the kidneys.

I sounded the patient but could detect no stone. I then made a cystoscopic examination under an anæsthetic, and found that there were two small ulcers of the bladder, ½ in. apart, situated about 1 in. behind the right ureteral orifice. One of these ulcers is slightly larger than the other, the larger being ⅓ in. in diameter, but otherwise they resemble each other in all respects. They are irregularly rounded, depressed below the general surface, as if a piece had been punched out of the mucous membrane. The bases of the ulcers are not visible, being covered with glistening white phosphatic deposit. The edges are raised and coloured red by blood pigment, outside which is a narrow pale, anæmic zone; and beyond this the ulcers seem to be set in swollen, congested, dark red mucous membrane, which gradually fades away into the pale healthy surface of the bladder beyond. The ureteral orifices are normal in appearance, and there is no other trace of disease in his bladder.

This, then, is a typical case of *primary* tuberculosis of the bladder. I have brought the patient here to-day, in order that you may have an opportunity of seeing an example of an extremely rare form of tuberculous disease; and I hope to be able to demonstrate to you later on the cystoscopic appearances as the case progresses. The case, besides, offers a convenient opportunity of making some remarks on tuberculosis of the bladder generally.

It is now recognised that tuberculosis of the bladder is a much more common disease than was imagined some years ago. This recognition of its comparative frequency we owe mainly to the introduction and extended use of the cystoscope and to bacteriological research, as aids to diagnosis.

·Tuberculosis of the bladder may occur as a *primary* disease of that viscus, when no evidence of its existence can be found in any other organ; or it may invade the bladder from some pre-existing tuberculous focus or foci, in which case the disease is termed *secondary*. The former type of invasion is extremely rare in comparison with the latter, and is probably due to the tubercle bacillus circulating in the blood stream locating itself in the tissues of the bladder.

Primary tuberculosis may begin in any part of the bladder, but it is most frequently seen by the cystoscope in its earliest stages on the posterior aspect of the viscus, behind the inter-ureteral bar.

When the bladder is attacked secondarily to the existence of tubercle in some organ outside the genito-urinary tract, the disease follows the same laws of invasion as to locality as in primary tuberculosis of that viscus.

But in the vast majority of cases, tuberculosis of the bladder occurs secondarily to some pre-existing focus in the kidney or genital apparatus, namely, the testicle, epididymis, vesicula seminalis, or prostate. In the former variety, termed the *descending* type, the bladder is first invaded around the orifice of the corresponding ureter; whilst in the latter, termed *ascending*, the tuberculous disease shows itself at the neck of the bladder and in the trigone. Writers differ widely in their views as to which of these two sources of invasion' is most common. My own experience would lead me to believe that they are about equally common in the adult male; but that in male children the descending form of tuberculosis of the bladder is most frequent. Tuberculosis of the bladder is found much more commonly in the male than in the female.

There are several different routes by which tubercle can be conveyed secondarily to the bladder:—(1) Through the blood. (2) By the lymphatics. (3) By extension, through continuity of surface, along the mucous membrane from the kidney or genital organs. This is by far the most common form of invasion. (4) By direct ulceration from the prostate into the bladder. (5) By infection, from the kidney, through the urine. It is a remarkable fact that tuberculous disease of the kidney may exist for years without the bladder getting secondarily infected, though bathed with pus conveyed from the former source. The mucous membrane of the bladder would therefore appear to possess considerable powers of resistance against the tubercle bacillus. Indeed, it is probable that congestion, inflammation, or abrasion of the mucous membrane is essential to render it amenable to attack in this way.

The first stage in tuberculous invasion of the bladder, as seen by the cystoscope, consists in infiltration of the mucous and submucous tissues, the mucous membrane being swollen and raised in irregular patches, presenting a highly congested or inflamed, dull red appearance, which gradually fades away into the healthy lining of the bladder. Small greyish nodules soon appear in these patches, which in course of time degenerate into cheesy matter. Their contents soften down, and, together with the mucous membrane covering them, necrose, and are cast off, leaving behind ulcers, with the characteristic features already described as existing in this patient. The ulcers, at first isolated, have a tendency to coalesce, forming irregular ragged patches, with raised margins. The mucous membrane around is inflamed, and fresh tuberculous nodules may be seen by the cystoscope springing up in it. The mucous membrane frequently displays small villosities, and may be elevated into nodular eminences, some of them as large as the tips of one's fingers, presenting the appearance of small sessile papillomata. As the disease progresses the whole surface may be flecked with blood pigment, shreds of mucopus, and phosphatic crusts, which cling to it so tenaciously that they cannot be removed by repeated washings through a catheter. Small phosphatic calculi, secondarily formed, are not infrequently found.

Dissemination of the tubercle takes place rapidly if the bladder becomes infected by pus microbes, induced by the introduction of septic instruments, or otherwise.

As a rule, the tuberculous ulcers are shallow, but they sometimes extend to the muscular layer, and even eat their way through the whole thickness of the bladder wall, fistulæ remaining, or into the perivesical tissues, urinary abscesses forming and making their way to the surface in the groins or perineum. This, however, is a rare occurrence. In advanced stages of the disease, the walls of the bladder may become greatly thickened, and its cavity extremely contracted, and perhaps pouched.

Tuberculosis of the bladder is most common between the ages of puberty and 35 years. I have, however, seen many instances of this disease in children of from 8 to 15 years.

The symptoms present in the case under consideration and their leading features are fairly typical of those generally attending tuberculosis of the bladder. You will observe that they are nearly allied to those of stone. Indeed, there are no two diseases of the bladder the symptoms of which so closely resemble each other as stone and tubercle; and, as a rule, a diagnosis can only be effected by sounding or cystoscopic examination, or both. When tubercle bacilli are found in the urine, they are pathognomonic of tuberculous disease in some part of the urinary track, but repeated examination of the urine may be necessary before the bacillus is found.

Hæmaturia, as in this case, is not infrequently the earliest symptom. It may exist for months before pain and increased frequency of micturition supervene. As a rule, it is slight, the urine being faintly tinged with blood; but when even slight ulceration takes place, it may be profuse, with passage of large clots. Indeed, on cystoscopic examination, one is frequently puzzled at the apparently trivial lesions found in presence of profuse hæmorrhage. One of the earliest symptoms of tubercle of the bladder is the painless passage of a few drops of pure blood at the end of micturition.

The hæmaturia, of whatever variety, is at first intermittent, lasting from one to three days, the urine then clearing up, and another attack not occurring for weeks or months. As the ulceration extends, the attacks of hæmorrhage become more frequent and pronounced, and eventually blood is constantly present in the urine. It will be found that the painless hæmaturia occurs when the ulceration is situated at a distance from the neck of the bladder. Once the trigone is invaded, pain and increased frequency of micturition are invariably present. The hæmorrhage is rarely so profuse as when resulting from a growth in the bladder. That from stone is invariably attended by pain, and is always aggravated by exercise, by which the hæmorrhage of tubercle is, as a rule, uninfluenced.

Increased frequency of micturition and pain are usually the initial symptoms. It is characteristic of tuberculosis that they are, as a rule, uninfluenced by exercise. Indeed, they occur just as frequently when the patient is lying down as when he is going about. In advanced stages of the disease there is an almost constant desire to micturate, accompanied by straining to expel an imaginary residue of urine.

The pain in the earliest stages of the disease is present only with the acts of micturition, and is frequently felt near the end of the penis behind the glans, but it is never, as in stone, confined to this region. It is of a burning or scalding character, and extends along the whole urethral canal. When the ulceration is extensive, pain is constant in the hypogastric region, but it is much enhanced when the bladder is at all disturbed. The supervention of general cystitis aggravates both this and the previous symptoms.

It is difficult to account for the intermittency of the flow of urine in the case before us. It is, I presume, due either to reflex spasm, or to an intuitive desire to avoid the pain consequent on the raw ulcers on the posterior and upper part of the bladder coming in contact with its neck when the viscus is empty. When the disease invades the trigone and neck of the bladder, intermittency is caused by the turgescence of these parts.

Incontinence of urine is not an uncommon symptom of this disease in children, and particularly in females; it indicates, as a rule, that the neck of the bladder is involved.

As with tuberculosis of other organs, loss of weight is an early symptom, and eventually general emaciation takes place. Fever may also occur, particularly should general cystitis supervene.

The prognosis in this disease is always grave, even when, as in the case under consideration, the ulceration is limited in extent. The tubercle has a tendency slowly but irresistibly to invade the adjacent mucous membrane, or to appear in isolated patches at a distance from the scene of its original invasion, the ulceration thus gradually extending. The advent of general cystitis adds greatly to the gravity of the disease.

What is the treatment indicated in the case before us? In all cases of tuberculosis of the bladder, general hygienic and medical treatment is of the utmost importance; and in its early stages this alone, without the aid of local measures, is frequently sufficient to arrest its progress and enable the patient to throw off the disease. Treat the case on general principles, as if it were one of tubercle of the lungs or other organ. There are cases on record, and I have seen such in my own practice, in which patients suffering from tubercle of the bladder have completely recovered; and I consider that, in this case, the disease being apparently limited, there is every prospect that under proper treatment the ulceration will be arrested and the disease eventually cast off. Cod-liver oil, iron, strychnine, carbonate of guaiacol, and other tonics should be employed, together with a nutritious diet; and the patient should live in the open air as much as possible: a dry, bracing climate would, of course, be advisable. There is a considerable quantity of pus in the urine; consequently, urotropin will be administered, in from 5- to 7-gr. doses three times daily, freely diluted with water, this being the most efficient drug we possess for all forms of pyuria. Salol and boric acid are also important drugs in this disease.

Some years ago "instillations" of iodoform emulsion came much into vogue, 1 oz. of a 5 to 10 per cent. solution of iodoform in glycerin and mucilage being injected daily, and allowed to remain, after washing out the bladder with boric acid or weak permanganate of potash solution. The results of this treatment, though vaunted at the time, have, by experience and closer examination, proved to be not very encouraging.

Injections of weak solutions of nitrite of silver constitute our sheet-anchor in ordinary cystitis; but this drug has been found to be not only useless, but actually injurious in tubercular cystitis.

The drug that has been found most efficacious for injections in this disease is corrosive sublimate; commencing with a strength of 1 in 10,000 in water, and gradually increasing it to 1 in 2000. Pass a soft catheter and draw off the urine, and inject 1½ to 2 oz. of the warm solution, which is at once allowed to flow off. Repeat this process three or four times. Before withdrawing the catheter, inject ½ to 2 drms. of this solution, which is allowed to remain in the bladder. The most scrupulous care must be taken that the instruments employed are thoroughly aseptic, because the bladder attacked by tubercle is particularly prone to infection, and infective cystitis in such cases is not only an agonising but almost a hopeless condition. I do not intend to employ injections or any other local treatment in this case, in the first instance; in fact, unless under general treatment the disease increases, because the problematical benefits derived from such treatment are, in my opinion, more than counterbalanced by the danger of infection from instrumentation.

For the relief of pain in this disease, morphia and belladonna, in the form of suppository, will be found most effectual.

The final procedure we have recourse to in tuberculosis of the bladder is cystotomy, either by the perineal or the suprapubic route. The former method has now been practically abandoned, because by this route one is unable to see the extent of the disease; and, secondly, as the tubercle is, as a rule, confined to the base of the bladder, whether to the trigone or round the ureteral orifices, a tube introduced through the wound into the bladder for drainage purposes would cause great irritation. Besides, there is a danger of the tubercle extending to the wound. But the chief reason for having recourse to the suprapubic operation is, that by this route we can not only feel the extent of the ulceration in the bladder, but actually see it by means of a speculum and forehead-lamp.

Cystotomy is had recourse to for two distinct purposes. In the first place, with a view to eradicating the disease when this is of a limited character. We attempt to effect this object by thoroughly scraping the ulcers with a sharp spoon and then rubbing in iodoform paste, or by applying the actual cautery freely to the ulcer and surrounding parts. There are certain cases, undoubtedly, in which this method proves successful; but in a still larger proportion of cases it fails to arrest the progress of this disease. You may naturally suggest that, the disease being limited in the case before you, a favourable opportunity is offered for surgical interference. My reply is, that experience teaches me that an operation of this kind should not be lightly undertaken, at any rate till the general treatment already indicated has failed to arrest the disease. But, should the ulceration spread in spite of this treatment, I shall be prepared to operate.

Secondly, in very advanced stages of this disease, when the ulceration is extensive, general cystitis and great contraction of the bladder exists, it may be necessary to perform cystotomy for drainage purposes, to relieve the terrible agony accompanying the over-distension of the contracted bladder and the constant desire to micturate.

THE REPORT OF THE INDIAN PLAGUE COMMISSION.

By CHARLES HUNTER STEWART, M.B., D.Sc., *Professor of Public Health, University of Edinburgh.*

THE Indian Plague Commission, whose Report has recently been presented to Parliament, was appointed in accordance with a resolution of the Government of India, on November 1898. After describing the introduction of plague into Bombay city, and its later spread in the Presidency of Bombay and other parts of India, and expressing the opinion that the efforts to stay the epidemic had been attended in many respects with marked success, the Governor-General in Council states, "That the time has now come when it is possible, as well as most desirable, to obtain reliable scientific opinion as to the manner in which the disease is communicated, the causes of the outbreaks in different parts of India, and the circumstances influencing their growth and decline. The facts connected with the outbreaks of the disease are still very obscure, and no such opportunity has arisen—and it may be hoped that none will arise in the future—as now presents itself for their investigation. . . . There are many circumstances connected with the outbreaks which require to be locally examined by persons who can collate the facts and form conclusions which will be accepted by public as well as scientific opinion in respect of them."

The Commission appointed was constituted as follows:—Professor T. R. Fraser, President; Messrs. Hewett and Cumine of the Indian Civil Service, and Professor A. E. Wright and Dr. M. A. Ruffer. They were instructed to inquire into—(1) the origin of the different outbreaks of plague; (2) the manner in which the disease is communicated; (3) the effects of curative serum of Yersin and Lustig respectively; (4) the effects of preventive inoculation.

The Report itself and the four large volumes of evidence and appendices will impress any one who carefully studies them, with the thoroughness with which the Commissioners have carried out their instructions, and the pains they have taken to get accurate information from witnesses—not all of whom were evidently able to express their opinions in clear and concise language. This difficulty was unavoidable in such an inquiry. But this notwithstanding, the volumes of evidence form a storehouse of facts for all future workers on the subject of plague. It has not seldom been remarked that scientific Commissions, instead of being helpful in elucidating the subject reported on, have sometimes rather darkened counsel, and even, by presenting views often arrived at by compromise among the members, have given authority and currency to conclusions not generally acceptable. In the Report under discussion this has been avoided; for where unanimity was not attained, different Commissioners have expressed their dissent, and the grounds on which this is based. These are found in the Appendix to the Report.

At the beginning of their Report, the Commissioners state that they had found it impracticable to avoid taking evidence on plague administration and its results, and that they could not exclude such evidence from their consideration, if they were to examine all aspects of the question submitted to them. The Government of India, while accepting the necessity for taking evidence regarding the facts of administration, left it to their discretion as to how far it was necessary or desirable to comment in their Report on the facts so recorded. Every one interested in preventive medicine will approve the action of the Commission in thus putting on record the facts, and in their Report critically discussing them. This part of the work of the Commission is unquestionably of the greatest interest and importance.

The Report concerns itself with the course of plague in India from the time of its appearance in Bombay city, in September 1896, up to the end of September 1899. It states that "the manner in which plague was introduced into Bombay city defies elucidation, and even the exact date of its introduction cannot be ascertained." The mortality, especially in some districts, has been appalling. In the three years there were 250,677 deaths reported as due to plague in the Presidency of Bombay and the native States connected with it, and 36,000 such deaths reported in the rest of British India and from native States outside Bombay. But these figures must much understate the true plague mortality, which they think must have been 430,500 deaths for the whole of India. Counting indigenous cases only, and taking the census population of 1891, the following gives the number of deaths to population during the three years in three different localities:—

Place.	Population.	Cases Reported.	Plague Deaths.
Poona City and Cantonments and Kirki	172,341	23,262	18,063
Karachi City . . .	105,199	10,498	8,156
Cutch Mandvi . .	38,155	6,999	5,832

In various villages in the Dharwar districts, in the autumn of 1898 the number of deaths from plague ranged from 22 *to* 25 *per cent. of the entire population.*

While the plague death-rate in the Presidency of Bombay has been very high, representing 6 per 1000 per annum, yet if the number of plague deaths be spread over the entire population of India, taken as 287,000,000, it represents only 0·5 per 1000 per annum. In British India, with a population of 221,000,000, the average death-rate during the years 1893–98 was—for cholera 1·6 per 1000 per annum, and for "fevers" nearly 20 per 1000 per annum. "Thus, though the figures of plague mortality when taken by themselves are high, it is evident that plague has not as yet been able to make itself felt as one of the most important factors that influence the total mortality of India."

Mode in which the bacillus enters the human organism.—That bubonic and septicæmic plague may be produced by the virus coming in contact with an abraded surface, is proven by infection while conducting post-mortem examinations on plague corpses. The frequency of infection through the skin surface is shown by the percentage of primary buboes which develop in connection with lymphatics originating in the skin. While the areas of skin surface which drain respectively into the neck, the axilla, and the groin, stand to each other approximately as 1 : 1·8 : 5, the hospital statistics show that the relation between the number of primary buboes in the cervical axillary and inguinal regions is as 1 : 1·3 : 5·8. The coincidence is certainly striking. They discovered no facts to prove that plague may infect through the stomach or intestinal tract. As regards the spread of primary plague pneumonia, they state there is need for further inquiry. There is no specific difference between the bacillus which produces bubonic plague and that which produces plague pneumonia, as cases of bubonic have been found to have originated from a case of pneumonic plague. The virulence, however, may differ. Further, primary pneumonic plague may be a mixed infection.

Incubation period.—On this subject the evidence of different witnesses differed much. Obviously, only cases in which the exact time of infection could be stated are available in determining this point. The number of such cases is naturally small, as in a country like India, with plague epidemic, it must be difficult to entirely exclude the possibility of an infection anterior to the time alleged. Of thirteen cases of accidental inoculation in the course of post-mortem work, the incubation period was from one to three days; and of sixteen cases in which the occasion of coming in contact with an infected person is known, the period was from eight hours to five days. In both series the average period was under three days. There seems to be a firm opinion among many plague officials in India that the period of incubation is, or may be, ten days. From the evidence there does not seem much to support this view, unless the course of events in evacuation and segregation camps is considered; but, manifestly, cases of long incubation periods occurring in such circumstances might have resulted from infection from earlier cases in the camp itself. The period of incubation, according to the Report, lies well within five days. It is interesting in this connection to note the result of Dr. Russel's observations in Aleppo, in the epidemics there in the years 1760–62.[1] He found it to vary from a few hours to four days or more, and rarely beyond ten days.

Direct infection from plague patients.—The evidence on this subject, which is very striking and consistent, relates chiefly to the nursing staff and attendants in plague hospitals. In many cases the attendants were relations of the patients, one and sometimes more being allowed per patient. In the Arthur Road Plague Hospital, where nearly 4000 cases were treated, there were only seven cases of plague among the hospital staff and relatives in attendance, and not one of these was traceable to infection from the patients. In the General Plague Hospital at Poona, there was no case of infection among a total of 4138 relatives in attendance on the sick, and only twenty-six cases occurred among the hospital staff, which numbered 376. In none of the hospitals in Calcutta was there any infection of the attendants observed. With much more evidence to the same effect, it is evident that the Commissioners are entitled to state: "The above figures show clearly that the danger of direct infection from plague patients is very small, under conditions such as those of hospitals in India, where attention is paid to the proper ventilation and cleanliness of the buildings, where the floors are, in a considerable number of the hospitals, periodically treated with disinfectants, and where precautions, such as the wearing of shoes, are, as far as possible, insisted on. It must further be noted, as enforcing what has been said above with regard to the smallness of the risk that is incurred by direct contact with the sick, that in the hospitals under consideration personal disinfection was entirely neglected by the large majority of the staff, and that the relatives attending on the sick rarely took even the most elementary precautions against infection. Not only did these last remain night and day with the patients, but they in many cases ate and drank out of the same vessels with them, not to speak of the fact that they, in some instances, received the sputum of the sick with their hands."

The evidence from the contact and segregation camps is also striking. In these camps one can observe the infectivity of the plague patient in circumstances of good ventilation, such as obtained in the authorised camps and during dry weather, and contrast this with that in circumstances of overcrowding and almost total want of ventilation which obtained frequently in the unauthorised camps, and almost invariably when evacuation of a plague-infected community had to be carried out during the

[1] "Treatise of the Plague," by Patrick Russel, M.D., 1791.

rains. Two examples illustrating the course of events under each of these conditions may suffice. During the three months January, February, and March, in the Contact Camp at Wari Bandar, near Bombay, there were 5363 admissions, and only 131 cases of plague, 126 of which occurred within six days of removal. In the city of Bombay, during the same period, there were 15,137 cases of plague reported. At Bangalore, among 924 contacts in camp, there were twenty-nine cases of plague, *i.e.* 3 per cent.; while among the population of the city generally, which, of course, included a large number who had not been in contact with plague cases at all, there were 3597 cases, or about 6 per cent.

The town of Limb, in the Satara district, was completely evacuated into huts made by the people themselves, that is, into a so-called unauthorised camp. These huts were made as air-tight as possible, and were virtually not ventilated at all. During eight weeks before evacuation there had been forty-five deaths, while in this camp the plague continued for twenty-two weeks, with 521 deaths. The town of Rahmatapur, in the same district, with a population of 6670, was completely evacuated into a camp with similar huts. During seven weeks before evacuation there were 106 deaths, and the plague continued in this camp for fifteen weeks, with 162 deaths. In explanation of the want of success of evacuation during the rains in Satara, Mr. Dodgson, I.C.S., stated that the evacuation huts "were like little bee-hives, with a little door which you can just walk in at," and practically without ventilation. Lieut. Anderson considered that in these circumstances the ventilation of the huts is often even worse than that of those in the village itself, and stated that as a result a large number in one hut will frequently take plague.

Whether one considers the positive proof from hospitals and well-ventilated and supervised contact camps, or the negative proof from overcrowded and unventilated camps, one is led to concur in the opinion expressed by Captain Childe, I.M.S., "that the infectiousness of (bubonic) plague seems to depend mostly on the surroundings of the patient. In a small room, crowded with many people, and in insanitary conditions, the infectious power is high; while in a well-ventilated room or hospital the infectiousness is very slight indeed."

In pneumonic plague, on the other hand, a high degree of infectivity has been found. The Commissioners draw special attention to a series of twenty cases, the original infection coming from Calcutta, and all proving fatal. In every case the infection was traced to contact with a previous case of pneumonic plague. "The above instances bring out with clearness the infective nature of pneumonic plague, and the risk that is run by those who are in attendance or contact with cases of this type. They also very strongly suggest that the infective material derived from a case of pneumonic plague tends to reproduce the disease in the same form."

Infectivity of patients convalescing from plague.—The channels by which the bacillus of plague may pass from the patient either during the course of the illness or in favourable cases during convalescence, are numerous. In primary pneumonic plague the sputum contains the bacillus during the whole course of the disease; and, in a case which recovered, Gotschlich[1] found it in the sputum thirty-three days after the temperature had become normal. In ordinary bubonic cases, the bacillus is for a time completely shut off from the surface, and only when septicæmic symptoms supervene does the infective matter escape by the discharges from nose, lungs, intestinal tract, etc. This infective period may last from a few hours to a few days. In fatal cases it may roughly coincide with the last twenty-four hours of the patient's life. In cases which run a favourable course, the pus from the suppurating bubo and the sputum and saliva may contain the infective material. The Commissioners have no bacteriological data available for fixing the length of time that the bacillus may remain in the pus from the suppurating bubo. In the description of the clinical features of plague, the President says on this point: "As it is believed, and the belief is supported by bacteriological evidence, that a convalescent may cause infection for from four to six weeks after all acute symptoms have disappeared, isolation for at least four weeks after the pyrexia has subsided is advisable, especially in cases of pneumonic plague, and in cases with protracted secondary broncho-pneumonia." Russel's opinion is as follows: "Till such time as future experience shall have established some degree of certainty, it would seem prudent to suspect all convalescents as long as any symptoms of disorder remain perceptible, and more especially in regard to such in whom the buboes continue open. It is not improbable that in old sinuous ulcers consequent to buboes the matter discharged may lose its contagious property before the healing of the sore, but all open pestilential ulcers should be held infectious till after the expiration of two months from the first attack."

Position of buboes.—Though by no means an invariable symptom of the disease, buboes are present in the great majority of cases, and hence the name bubonic plague. In the majority of cases they appear within six hours after the beginning of the illness, though their appearance may be delayed for three or four days. Their appearance frequently coincides with the production of pyrexia. A good deal of attention has been paid by most observers to the position of these swellings. The following are the facts on this subject contained in the Report, treated, however, in such a way as to make a comparison with Russel's observations possible:—

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[1] *Ztschr. f. Hyg.*, Leipzig, 1899, S. 405.

	Present Indian Epidemic.			Epidemic in Aleppo, 1760–62.		
	No. of Cases.			No. of Cases.		
			Per cent.			Per cent.
Cases with buboes in either groin, axilla, or neck.	6000	Groin . . .	70·8	2641	Groin . . .	69·8
		Axilla . . .	18·0		Axilla . . .	21·5
		Neck . . .	11·2		Neck . . .	8·7
		Right Side, per cent.	Left Side, per cent.		Right Side, per cent.	Left Side, per cent.
Cases with buboes in groin . .	2838	51·5	48·5	1609	55·3	44·7
Cases with buboes in axilla . .	970	50·8	49·2	538	51·6	48·4

Duration of fatal cases.—There is a difficulty in arriving at a fair average, owing to a possible difference in the virulence of the disease at different times and places, and also to inequality in the promptness of removal of cases to hospital. Of 3035 fatal cases admitted to hospital, death occurred within two days in more than a third, within three days in more than a half, and within five days in 93 per cent. of the cases.

Statistics of mortality.—The case mortality varies in different periods of the same epidemic. This has been well marked in Bombay city, the curve of incidence and the curve of case mortality rising together to a maximum and then again falling, so that at the beginning and end of an epidemic the number of cases is smallest and the case mortality of these is least. Of 15,840 cases in hospital, the case mortality was 73·48 per cent. In order to obtain a true estimate, it is necessary to deal with as many cases as possible, drawn from a large area, and extending over a prolonged period. In Bombay Presidency and the native States connected with it, during the period from September 1896 to 1st June 1900, there were (excluding cases among Europeans) 392,385 cases reported and 308,140 deaths, giving a case mortality of 78·53 per cent.; the highest recorded in these statistics being 83·7 per cent. and the lowest 59·3 per cent. Sex does not seem to have a marked influence. Of 5294 cases collected, the case mortality among males was 71·15 per cent., and among females 69·37 per cent. Age has, however, a great influence, as is shown by the following table derived from 4215 cases collected by different observers :—

Age.	Case Mortality.
0– 1 year	12·5 per cent.
1– 5 „	75 „
5–10 „	69·1 „

Rising regularly in each decade to—

Age.	Case Mortality.
50–60 years	80·2 per cent.
60–70 „	67·5 „
70– „	50 „

Statistics of incidence.—Sex does not seem to exert much influence. As regards age the influence is marked. The following table is derived from 4734 cases:—

Age Period.	Per 1000 living at Age Period.
0– 5 years	5·15
5–10 „	22·3
10–20 „	42·5
20–30 „	34·6
30–40 „	41·6
40–50 „	36·25
50–60 „	31·6
60– „	19·37

(*To be continued.*)

THE CAUSATION OF PARALYSIS IN DIPHTHERIA.

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(Plate I.)

A consideration of the clinical manifestation of the paralyses which occur in different cases of diphtheria will readily lead to the conclusion that such condition might be due to one of two causes, or to the combined effects of both. That is to say, these paralyses might result from some disturbance at the central end of the neuron—in the ganglia of the spinal cord,—from some alteration in the peripheral fibre, whereby its conductivity is impaired, or, finally, by an affection of the neuron as a whole. In the common diphtheritic paralysis of the palate, for instance, we have fairly clear evidence of an affection of the peripheral fibres of a portion only of a nerve. But in other cases it is impossible, by clinical observation alone, to determine the individual influence of each of the two possible causes respectively; and effort has accordingly been made to solve the problem by investigating the microscopical appearances, in different regions of the nervous system, in fatal cases of diphtheritic paralysis in man, and in lower animals after inoculation either with cultures of living bacilli or with the specific toxines, in the hope that definite alteration in structure might indicate the actual seat of impaired function.

In the course of an investigation into the action of various bacterial toxines, and other toxic substances, on the ganglion cells of the cerebral cortex and spinal cord, on which we have been engaged during the last three years, we have had occasion to examine the central nervous system in a series of experimental animals which had received injections of an actively toxic sterile diphtheria broth. We have also been able to examine the motor ganglia of the spinal cord from seven cases of diphtheria in children, in only three of which, however, had definite symptoms of paralysis been observed.

The experiments were made in an endeavour to ascertain—(1) Whether diphtheria toxine produces alterations in the elements of the central motor ganglia, of such a nature that they are accompanied by change from the normal appearance of the cells when Nissl's method of staining is employed; and if such changes are produced, (2) whether they are sufficiently definite, and of sufficiently frequent occurrence, to justify us in accepting them as an essential part of the pathological changes which result from the action of diphtheria toxine.

The methods employed were carried out in the way which we have described in former papers (1) on the action of the toxines of *Bacillus typhosus* and *B. tetani* on the cells of the central nervous ganglia, and our results are consequently comparable in every way with those which we have already recorded.

Experimental diphtheria intoxication of guinea-pigs.—The following table gives the result of our experiments on guinea-pigs. The animals received various doses of a sterile toxic diphtheria broth, the minimal lethal dose of which was approximately 0·01 c.c. for a guinea-pig of 250 grms. weight.

In the first six animals the cerebral cortex was examined, in the last three the motor ganglia of the spinal cord.

The results of our examination show that, whilst under the conditions of the experiments in the greater number of cases there was no alteration from the normal in the ganglion cells, a certain number showed a definite alteration in structure. Such alteration was obvious on comparison of the affected cells with apparently normal cells, which might be seen side by side with them in the same section. The principal changes observed were a swelling of the cell generally, and an irregularity of its contour, together sometimes with an appearance as of a pulverisation of the Nissl bodies, the last change causing an appearance of a pallor of the cell body. In the case of guinea-pig 4 there was a relatively deep staining towards the edge of the cell, but no pallor of the central portion, such as we have frequently observed in tetanus when the peripheral portion of the cell stains more deeply than usual. We may just add that, with a sterile toxic broth

[*Continued on page* 56.

TABLE. I.—*Animal Experiments.*

Animal.	Dose of Filtered Diphtheria Broth.	Duration of Experiment.		Condition of Motor Ganglion Cells (with Nissl's staining).
Guinea-pig 1; weight, 333 grms.	0·1 c.c., and 24 hours afterwards a second dose of 0·1 c.c.	45–60 hrs.	Died during the night after the second injection.	Nucleus and nucleolus normal in appearance. Some of cells rather swollen and presented a "woolly" appearance. Nissl's bodies rather indefinite.
Guinea-pig 2; weight, 315 grms.	0·05 c.c., and 24 hours afterwards a second dose of 0·1 c.c.	67 hrs.	Killed under chloroform 43 hrs. after the second injection.	Some slight irregularity in staining of cell body, but no well-defined areas of dark staining. Individuality of Nissl's bodies distinct everywhere. Nuclei stained rather deeply.
Guinea-pig 3; weight, 305 grms.	0·05 c.c., and 24 hours afterwards a second dose of 0·1 c.c.	64 ,,	Died 40 hrs. after the second injection.	Some of the cells were stained rather deeply towards their edge; otherwise no definite alterations.
Guinea-pig 4; weight, 288 grms.	0·01 c.c.	24 ,,	Killed under chloroform 24 hrs. after injection.	A few cells resemble the abnormal cells seen in guinea-pig 1.
Guinea-pig 5; weight, 314 grms.	0·01 ,,	45 ,,	Died 45 hrs. after injection.	Nuclei stained rather deeply as in guinea-pig 2.
Guinea-pig 6; weight, 345 grms.	0·01 ,,	72 ,,	Killed under chloroform 72 hrs. after injection.	Nuclei stained deeply as in guinea-pig 5.
Guinea-pig 7; weight, 318 grms.	0·05 ,,	36–48 hrs.	Died during second night after injection.	A few of the cells of the anterior cornua were swollen; their outline was irregular, and the chromatophile granules were indistinctly defined. These cells had a general "blurred" appearance (*vide* Plate I. Fig. 2).
Guinea-pig 8; weight, 320 grms.	0·05 ,,	30 hrs.	Killed under chloroform 30 hrs. after injection.	No definite changes found in cells of anterior cornua.
Guinea-pig 9; weight, 541 grms.	1 ,,	25 ,,	Died 25 hrs. after injection.	No definite changes found in cells of anterior cornua.

TABLE II.—*Cases of Diphtheria Infection in Man.*

Case.	Note on Clinical Conditions.	Changes found in Ganglion Cells of Anterior Cornua of Spinal Cord.
1. Alice W.	Death occurred 3 days after onset of symptoms.	No definite changes seen; there was, however, some inequality in the general staining of different cells.
2. Winnie P., æt. 7.	Death occurred 3 days after admission into hospital. The disease was of a hæmorrhagic type.	The outline of the cells was well defined; the chromatophile granules were of normal appearance; the outline of some of the nuclei was blurred and indistinct.
3. Lilian H., æt. 2.	Death occurred 4 days after admission into hospital. The disease in this case, as in 2, was of a hæmorrhagic type.	In a large number of the cells the nuclei were eccentric in position, and with an indistinct or blurred outline. No other changes were seen.
4. William D., æt. 7.	Death occurred 14 days after admission into hospital. On admission there was nasal intonation with regurgitation of food; deglutition paralyses and general limpness of limbs.	The internal structure of the cells was normal in appearance. The outline of the cells was in many instances blurred and rounded, so that the cells appeared to be swollen; the appearance being like that seen in guinea-pig 7 (see Plate I. Fig. 2).
5. F. T., æt. 2.	Death occurred 11 days after admission into hospital. Symptoms of cardiac dilatation, persistent vomiting, and diarrhœa.	Cells were quite normal in appearance.
6. Phyllis B., æt. 3.	Death occurred 32 days after admission into hospital. There had been general limpness of the limbs, weak diaphragmatic breathing, absence of knee-jerk, scaphoid abdomen, nasal intonation, and persistent vomiting at the end.	Cells of anterior cornua of cord, and of nuclei of medulla, were of normal appearance.
7. Harry R., æt. 5.	Death occurred 9 days after admission into hospital. Diphtheria 6 weeks before admission, treated with antitoxic serum. On admission had vacant expression, palate was fixed, diaphragm acted badly, heart sounds irregular, absence of patella reflex, and regurgitation of food.	A large number of the cells of the anterior cornua were swollen in size, and of indefinite outline; the chromatophile granules also appeared swollen, and showed signs of disintegration.

in the doses which we used, there was practically no rise in temperature which could produce any simple pyrexial change in the cells.

Examination of the anterior cornua of the spinal cord in cases of diphtheria in children.—We have also examined the spinal ganglion cells in seven cases of fatal diphtheria in children. And for the opportunity of examining this material we are indebted to Dr. Basan of the Homerton Fever Hospital, and to Dr. Lister of the North-Eastern Hospital for Children.

In case 7 a considerable interval elapsed between death and the removal of the cord for examination; we therefore do not regard the very distinct changes which were found in this case as having been necessarily due to diphtheria intoxication, we think that a natural after-death degeneration may have already been in progress.

It will be seen that definite changes were found in four cases, the most obvious alteration being a swelling of the cell, with blurring of its outline.

On the other hand, in three cases no change was found, except that in one of them there was an inequality in the staining of the cells, which may have been accidental. It must be noted that in two of these cases, in which no changes were found after death, the examination was made some little time after the onset of symptoms, that is, after eleven and thirty-two days respectively, and that in one of the cases definite symptoms of paralysis had been observed.

We may conclude, therefore, as the result of our experiments, that certain changes in the central portion of the neuron may be caused by diphtheria intoxication, but our series of cases is not sufficiently extensive to throw much light as to the exact period of intoxication at which changes are most likely to be found. Nor do our animal experiments show the possible effects of sub-lethal doses of the toxine, after some length of time has elapsed. Further light, however, is thrown on the subject by the large amount of experimental work which has been carried out by others.

Thus Crocq (2), from the appearances found in experimental rabbits, came to the conclusion that in diphtheria intoxication of these animals changes occurred both in the nerve cells of the ganglia and in the peripheral fibres, but that the changes in the latter were always secondary to those in the former. As regards man, however, there appeared to be clinical reasons for suspecting that there might be two methods of causation; the paralysis of the palate, eyes, and pharynx being probably due to a primary peripheral neuritis; whilst, on the other hand, the paralysis affecting the lower limbs, and sometimes becoming generalised, appeared to him to be probably due to some central change.

Mouravieff (3), in five cases of acute and subacute diphtheria intoxication of guinea-pigs, found definite alteration in the cells of the anterior cornua of the spinal cord. These changes included a peripheral chromatolysis and a vacuolation of the cell substance. Thus the changes in the first animal are described as follows:—"Il y a des cellules, dont la plus grande parti est occupée par une vacuole qui n'est entourée que d'une couche très fine de substance protoplasmique; dans ce cas, le noyau se trouve à la péripherie de la cellule." In one of the cases vacuolation changes were also found in the posterior horn cells, together with slight peripheral chromatolysis, and vacuolation in the ganglion cells of the cerebral cortex.

Mouravieff concluded that the first nervous lesions which appear in the guinea-pig, as the result of diphtheria intoxication, are special changes, such as those described above in the motor ganglion cells, and especially in those of the anterior cornua of the spinal cord. At first there is no alteration in the peripheral nerve fibre, but in some five or six weeks' time one may find very distinct evidence of a peripheral neuritis. And by the time that this peripheral nerve change is in evidence, the cells of the anterior cornua will have resumed their normal appearance, all the previously altered cells having either regained a healthy condition, or having undergone atrophy and disappeared without leaving any trace behind.

F. E. Batten (4) investigated the condition of the nerve trunks in cases of post-diphtheritic paralysis, and found that in nearly all cases of long standing, definite and constant pathological changes could be found in the peripheral nerves. The same writer, in a second paper, published the results of a careful examination of the peripheral nerves in five additional cases of post-diphtheritic paralysis, using Marchi's, Pal's, and Stroebe's methods of staining. In three of the five cases the nerve cells of the anterior cornua were also examined by Nissl's method. Batten sums up his results as follows:—"Five cases have been examined; four of these exhibited the characteristic changes in the nerves or roots, while in only one were these absent. Changes in the anterior horn cells have been noted in two cases; in one of these, however, only a single altered cell was found; and, in another, the cause of death, and the interval between death and post-mortem, is too great to allow one to accept this case without hesitation; and I can only repeat the conclusion of my former paper, namely, that the dominant lesion in diphtheritic paralysis is a parenchymatous degeneration of the myelin sheath of the nerves . . . the effect of the poison manifests itself (at least in fatal cases) in the myelin sheath and not in the cell body." Thus Batten's work confirms the observation of others as to the occurrence of peripheral neuritis in post-diphtheritic paralysis; but it scarcely touches the question of lesions in the anterior cornua, since only two reliable cases were examined.

Rainy (5) has made a valuable contribution to our knowledge of the subject. In one case of post-diphtheritic paralysis in a child, he was able to demonstrate vacuolation and early chromatolysis in some of the cells of the anterior cornua. A series of experimental guinea-pigs were inoculated with either living cultures of *B. diphtheriæ* or with sterile toxic broth. Rainy arrived at the following conclusions :—" Diphtheritic paralysis is associated, not only with changes in the peripheral nerves, but also with alterations in the spinal cord itself. In my experiments, such changes were invariably present after death, when paralysis was observed during life. Of the latter, cellular changes are the most characteristic. They may, however, be associated with vascular ones. The changes are very definite, and consist in chromatolysis to a moderate degree, in increased staining capacity of the achromatic substance for acid stains, and vacuolation of the cell protoplasm. . . . In diphtheritic paralysis the cell change is probably antecedent to the nerve change in the majority of cases. This, however, requires further investigation before it can be asserted with confidence."

Bielschowsky and Nartowski (^{6}) found, in experimental diphtheria intoxication of rabbits, guinea-pigs, and mice, that changes occurred in the peripheral nerves, in the spinal cord, and in the muscles. They conclude that the essential lesion is a parenchymatous degeneration of the peripheral nerves ; whilst the slight changes which they found in the cells of the anterior cornua were looked upon as being only of secondary or " cachectic " origin.

The work of the writers whose conclusions we have thus briefly quoted does not by any means represent all that has been done in this matter ; we have merely referred to those whose results may be taken as fairly representative. For the full literature of the subject reference may be made to Rainy's paper, which we have quoted above.

Our own experiments show that, independently of any obvious paralysis, certain changes in structure may be found in the motor cells of the anterior cornua of the cord, at an early stage of experimental diphtheria intoxication. And our observations merely confirm what has been found by others who have worked especially at the pathological changes in the cord. But, on the other hand, it is certain that a peripheral neuritis may occur both in human cases when the disease is acquired naturally, and also in animals intoxicated for experiment.

Mouravieff's work now becomes specially important, in that he found motor ganglion cell changes in the earlier days of experimental general intoxication, and peripheral nerve changes later on. And, moreover, he found that by the time a peripheral neuritis was established, the motor ganglia had regained a healthy appearance ; either the affected cells had undergone a complete regeneration, or else had atrophied to such a degree that they could no longer be distinguished. Of the two explanations the

PLATE I.

spinal cord
× 450.)

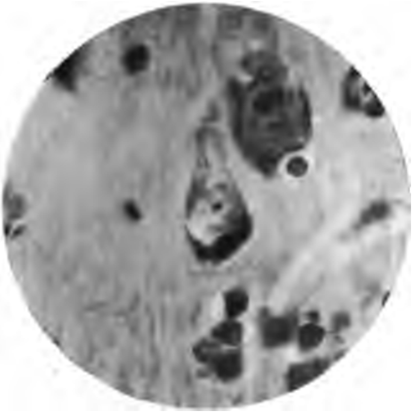

FIG. 3.—Motor cell from cerebral cortex of guinea-pig after injection of tetanus toxin. The condition shown is one of central pallor with peripheral chromatophilia. (Microphotograph × 450.)

guinea-pig after
ppears swollen,
raph × 450.)

former seems to us to be the more probable: if the affected cells had undergone a permanent atrophy, one would expect a permanent paralysis of parts or of groups of the muscles concerned, as in infantile paralysis.

We may conclude, then, that in some cases of diphtheritic paralysis a descending affection of the neuron occurs, commencing in the portion lying in the motor ganglia; and it is not unlikely that the peripheral affection in these cases is not so much caused by the action of the toxine itself as by nutritive changes following on the lesion of the central portion of the neuron. Our knowledge as to the selective action of toxic substances on the different segments of the neuron is at present defective, but there is evidence that in some cases, at any rate, such selective action does occur. And we assume that the cell body of the neuron is more easily affected by the circulating toxines than the peripheral processes.

But, on the other hand, in the common palate paralysis of diphtheria, for instance, there is distinct evidence of a peripheral affection; and it is significant that in such cases the muscles paralysed are those in connection with peripheral nerve fibres which come into close relation with the seat of toxine formation in the throat and naso-pharynx. In other words, the concentrated action of the toxines at the seat of their formation may in some cases be sufficiently powerful to affect the peripheral segment of the neuron. Whereas, in cases in which the paralysis is obviously caused by the action of diluted toxine circulating in the blood, as in paralysis of the lower limb muscles, we conclude that the more susceptible ganglion cell may be affected by a degree of toxæmia which is not always sufficient to set up a primary change in the peripheral nerves. With the affection of the motor cells, a descending lesion, due to nutritive disturbance, occurs, and so we get the peripheral neuritis of a later stage.

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Report of the Edinburgh and East of Scotland South African Hospital. Edited by DAVID WALLACE, C.M.G., F.R.C.S.Ed.; and FRANCIS D. BOYD, M.D., F.R.C.P.Ed. Edinburgh: Oliver & Boyd.

IT seems but yesterday that, on a grey March day, in the grey quadrangle of the old University, a little khaki-clad band paraded, prior to leaving for the front upon a philanthropic mission. So quickly do events move, that the Edinburgh South African Hospital, as a distinct entity, is long since a thing of the past, and the record of its work lies before us. Like the staff, it is khaki-clad and adorned by the red cross, nor does the tasteful cover belie its contents, as a glance at the illustrations will reveal. These are remarkably clear, owing to the admirable reproduction of the photographs. It is a pity that, when otherwise so complete, the leaves of the volume have not been fully cut, for nothing is more irritating than the enforced and frequent use of the paper-cutter.

The report is edited by Mr. Wallace and Dr. Boyd, and the book opens with a general account of the hospital, from its inception to its close. It is apparent that all was not smooth sailing, and that several initial difficulties had to be overcome; but, once started, the Edinburgh Hospital appears to have done useful and excellent work. One notes that, unlike most of the war hospitals, its out-patient department bulked largely, while carbolic acid, corrosive sublimate, and formalin were the disinfectants employed in place of the ubiquitous izal. There is not much to arrest attention under general surgery, though veldt sores are discussed at some length; and the conclusion arrived at is, that they are a form of septic ulceration, occurring in debilitated conditions, dependent upon the *Staphylococcus pyogenes albus*, the mode of transmission being chiefly by horse-flies and sand.

There is little attempt made to seriously consider military surgery, but numerous cases of shell and bullet wounds are described and here and there commented upon. A terrible case of injury to the jaw is included, where a very satisfactory result was obtained by operation, as shown by three sets of good photographs. The method employed to exercise the muscles of the lower lip was one highly appreciated by the patient, who has reason to be thankful for good nursing and skilful surgery. One non-suppurating shell wound is recorded, whereas Makins observes that septicity is invariable in such lesions. The immunity from serious symptoms after chest wounds is noted; and the history of the patient who, shot through the abdomen, practically saved his life by refraining from food, though by no means unique, is full of interest. The plan of outlining bullet tracks in red upon skeleton diagrams is ingenious and useful, though at first it suggests the post-mortem room and a considerable mortality! The work was chiefly medical, consequently this section of the record is given in more detail, comments are appended, and problems discussed. The treatment of the severe hiccough occurring in a case of enteric fever which recovered, might with advantage have been given, as this condition is one of the gravest complications of that disease, and, as seen in South Africa, was usually fatal. Thrombosis seems to have been fairly frequent, and Dr. Boyd has something to say upon post-typhoidal pyrexia.

A table of cases, apparently enteric, which failed to give the Widal reaction, is included, but no very satisfactory explanation is forthcoming. An interesting case, where abdominal tuberculosis was very naturally mistaken for enteric, is described, but no mention is made of the Widal test being employed to check the diagnosis. This may, however, be due to the fact that the laboratory, which must have been found of great value, may not have been in working order at that time. Inoculation is not highly praised. Indeed, the question is treated with proverbial Scottish caution, and the ill effects of the measure in a solitary instance are duly mentioned.

We find nothing new stated with regard to "simple continued fever," or dysentery, but, as elsewhere, the amœba coli was found to be absent in the Edinburgh cases. The general records of disease, however, are clear and concise, the temperature charts well reproduced, and the appendices give a good résumé of the work accomplished, and the results obtained, which were eminently satisfactory, all things considered. A word must be said in praise of the X-ray photographs, and the table devoted to the consideration of this branch of surgical art. On the whole, the report forms an interesting souvenir of the history of the hospital, and is not devoid of value to the profession generally.

Andrew Balfour.

Some Recent Works on Diseases of the Ear, Nose, and Throat.

1. *Manual of Diseases of the Ear, including those of the Nose and Throat in relation to the Ear.* By Thomas Barr, M.D. Third Edition. Glasgow: James Maclehose & Sons. 1901.
2. *Maladies du Pharynx: Traité médico-chirurgical.* Par E. Escat. Paris: Georges Carré et C. Naud. 1901.
3. *Diseases of the Nose and Throat.* By F. de Havilland Hall, M.D., and Herbert Tilley, M.D. Second Edition. London: H. K. Lewis. 1901.
4. *A Handbook of Diseases of the Nose and Pharynx.* By James B. Ball, M.D. Fourth Edition. London: Baillière, Tindall, and Cox. 1901.
5. *Purulent Nasal Discharges: their Diagnosis and Treatment.* By Herbert Tilley, M.D. London: H. K. Lewis. 1901.

6. *Rhinology, Laryngology, and Otology, and their Significance in General Medicine.* By E. P. Friedrich, M.D. Translated from the German. Edited by H. Holbrook Curtis, M.D. Philadelphia and London: W. B. Saunders & Co. 1900.

The recent publication of so many volumes dealing with diseases of the ear, nose, and throat, demonstrates that in this branch of specialism, at any rate, there is no lack of literary activity. With the exception of Escat's new treatise on diseases of the pharynx, the text-books referred to above have reached a second, third, or even a fourth edition. It is evident, therefore, that the increased demand for literature dealing with this branch of medicine and surgery fully justifies the time and the labour which these authors have expended upon their work. Turning, in the first instance, to Barr's "Manual of Diseases of the Ear" (1), we find that the third edition of this useful work, revised and in some parts rewritten, is issued five years after the publication of the second edition. In every respect the volume maintains the high standard of excellence which was reached by the earlier editions, and we have no hesitation in again recommending it as one of the best books upon the subject. It is natural that the most important changes should be found in the chapters dealing with the results of purulent disease of the middle ear and their treatment, because it is in this department of otology that so much useful work is being done. The printing, illustrations, and general style of the book add materially to the pleasure which its perusal gives us.

Escat's "Maladies du Pharynx" (2) is a large volume containing 500 to 600 pages, and is devoted entirely to a study of the diseases of the pharynx and naso-pharynx. This fact sufficiently indicates the great development which specialism has reached in this department of medicine and surgery. The reader cannot fail to be struck with the thoroughness and the care with which the author has done his work. At the same time the publishers are to be congratulated upon the handsome way in which the volume has been produced. A large number of excellent black and white drawings afford ample evidence of Monsieur Escat's ability as a draughtsman, and his power of thus reproducing what he observes. One exception, at any rate, must be made to this general statement, namely, that Fig. 103 does not appear to us to be a satisfactory representation of lupus of the palate. A short sketch of the anatomy and physiology of the region, and a description of the methods of examination, is followed by a long and detailed account of the acute inflammatory affections of the fauces and pharynx. Recognising that in the present state of our clinical and bacteriological knowledge, a classification of the acute affections of the fauces, based upon their bacteriology, is not possible, the author tabulates a somewhat elaborate classification of the acute inflammations of the throat on a clinical and anatomical basis. While admitting the ability which he displays in the construction of this table, we are rather inclined to look upon it as of greater theoretical than practical value. In the chapter dealing with the chronic affections of the pharynx which follows next, no mention is made of the condition now generally recognised and described as a keratosis. Indeed, the valuable work of Siebenmann and Brown Kelly is apparently ignored. One hundred pages are devoted to a consideration of adenoid vegetations, and nearly the same space to a description of tumours of the naso-pharynx and palate. The neuroses of the pharynx and its malformations complete a very exhaustive treatise upon the affections of this region.

This is the second edition of de Havilland Hall's contribution to the literature of this subject. With the collaboration of Dr. Herbert Tilley, the volume on "Diseases of the Nose and Throat" (3) has been considerably enlarged and brought up to date, and yet it remains a book of a very suitable size. We have no hesitation in describing it as a concise and reliable guide to the study of diseases of the throat and nose. It contains much useful information, which bears the stamp of practical experience.

A number of illustrations are interspersed throughout the text. It appears to us open to question as to how far any real practical advantage is gained by figuring so many instruments in a book of this kind. As a rule the instrument-maker's catalogue furnishes an excellent illustration of what is necessary. Bellocq's sound is not only figured, but is described as the best instrument for the introduction of the post-nasal plug in the treatment of epistaxis. It would be interesting to know how many surgeons have found it of real advantage for this purpose. In discussing the treatment of ozæna, the authors lay great stress upon the value of cleansing the nose in this distressing affection, and the procedure is described in a useful and practical way. No reference, however, is made to the use of cupric electrolysis, an omission to which attention should be drawn, in the light of the undoubted relief which may be obtained from its use in a number of cases. An excellent chapter upon the inflammatory affections of the accessory sinuses bears the imprint of Dr. Tilley's pen. In short, we recommend this handbook to the notice both of the student and the practitioner.

As the title suggests, Dr. Ball's volume (4) deals with diseases of the nose and pharynx, including in this a chapter upon suppuration in the accessory cavities. The various affections of these regions are briefly discussed and the different methods of treatment described. These descriptions are given mainly along lines similar to those previously followed. The fact that this handbook has reached a fourth edition sufficiently indicates that it meets the necessary requirements, and affords sound and reliable information to the reader.

Turning next to Dr. Tilley's monograph on "Purulent Nasal Discharges" (5), we cannot but realise the important bearing which a chronic purulent nasal discharge has in relation to the general health of the individual. The disordered digestion, the mental depression, and the loss of energy, which are so frequently seen in patients suffering from a persistent discharge of pus from the nose—and this is especially true when the source of the pus is in one or more of the accessory cavities—afford evidence of this fact. It is therefore very necessary for the physician to recognise this as the possible origin of his patient's symptoms.

The author of this small volume has presented us with a very clear and precise account of the various causes which may give rise to nasal suppuration. Part i. deals very briefly with those cases in which the suppuration originates in the nasal chambers themselves, and which may be due to such conditions as syphilis, tubercle, ozæna, the exanthemata and foreign bodies. In Part ii., which constitutes the greater portion of the volume, Dr. Tilley discusses at some length, and in considerable detail, the diagnosis and treatment of suppuration in the accessory sinuses. It is to these pages that we turn with most interest, as the author, from a large experience especially of disease in the frontal sinuses, has a right to speak with some authority upon the subject. A short sketch of the anatomy of each sinus forms a fitting introduction to the clinical consideration of the disease. As there is apparently a difference of opinion amongst writers regarding the nomenclature of the parts situated in the outer wall of the middle meatus, it is perhaps hardly fair to adversely criticise Dr. Tilley's description of this region of the nose. Nevertheless, we do not agree with what he has written regarding the infundibulum and the hiatus semilunaris.

The infundibulum is the gutter or groove into which the maxillary ostium and some of the ostia of the anterior ethmoidal cells open; it is not the lower and widened end of the fronto-nasal canal, which in many cases has no connection with the infundibulum. The meatus semilunaris, as its name implies, is merely the half-moon shaped opening or gap, bounded below by the free edge of the uncinate process, and through which the infundibulum communicates with the middle meatus. It is not the gutter or groove that the author's description would lead us to suppose. In describing the intranasal puncture of the antrum for diagnostic purposes, the author omits to draw attention to the necessity of first carefully cleansing the nasal chamber of every trace of pus before proceeding to syringe the antrum through the cannula. Unless this preliminary step is carried out, we cannot be certain that the pus washed out from the nose comes from the antral cavity, has been secreted in the nose itself, or has drained into the nasal chamber from one of the other sinuses. The author apparently prefers the open drainage tube in the treatment of suppuration of the maxillary sinus through the alveolus. Dr. Tilley does not write in favour of intranasal irrigation of the frontal sinus as a cure in cases of chronic suppuration, an opinion which we are inclined to support. The frequent anatomical irregularities in the cavity and the marked pathological changes so frequently observed in its mucous lining make a cure almost impossible. Dr. Tilley's large clinical experience, and the success which has attended his operative interference in a number of cases of sinus suppuration, give weight to the views which he has so lucidly expressed in this volume.

E. P. Friedrich's volume on "Rhinology, Laryngology, and Otology, and their significance in General Medicine" (6) is one which must prove of considerable value alike to the general practitioner and to the specialist. The former may fail to recognise special symptoms which may be of the greatest importance to him in the diagnosis of disease, while there may be a tendency for the latter to forget at times that the region to which he devotes his attention is not a thing apart, but a member of a corporate whole. The object of this work is, therefore, mainly to keep the specialist in closer touch with general medicine, and as such it forms a valuable book of reference and a useful addition to the library. The edition now before us is an English translation of the original German edition, and is edited by Holbrook Curtis of New York. The various affections of the ear, nose, and throat that may be met with in diseases of the different systems—respiratory, circulatory, digestive, etc.—are dealt with in separate chapters; a special chapter is devoted to the local conditions and appearances met with in the acute and chronic infectious diseases; while the laryngeal and aural affections which arise in the different forms of nerve disease are studied at some considerable length. As a book of reference, with a very complete bibliography of the various authors who are quoted, this volume can be recommended to the notice of the profession.

A. Logan Turner.

Outlines of Gynæcological Pathology and Morbid Anatomy. By C. Hubert Roberts, M.D., F.R.C.S. London: J. & A. Churchill. 1901.

This very attractive volume will be appreciated by all who teach gynæcology or who deal practically with disease of the female reproductive organs. Though not a very large book, it gives a very complete review of the subject, the more common conditions especially being very adequately discussed. The most striking feature of the work is its essentially British character. It is indeed a pleasure to read an author who is familiar with the work of his own compatriots, and who puts no fictitious value upon an opinion because it comes from a far country.

There is not a single bad illustration amongst the 151 figures, and many of them reach a very high standard of excellence. The majority of these are original drawings, by the author, of specimens which may be seen in London at any time either in various museums or in the collections at the Samaritan Free or at St. Bartholomew's Hospital. There are some micro-photographs which show that Dr. C. H. Cosens is an expert in this branch of photography. Photographs, however, fall far behind drawings of micro-sections in expressive value, and authors should bear in mind that the main use of the micro-photograph is as a guarantee of good faith in original papers. In the text, the author has kept as far as possible to the pathological aspect of gynæcology, but he has found it necessary to include certain clinical details, especially in considering the results and sequence of various conditions. By omitting these clinical details, the author would have distinctly lessened the value of the book. It is only on reading a work of this kind that one can realise how large a portion of our gynæcological pathology depends as yet upon clinical study and not upon post-mortem or post-operative observation of specimens. Thus the changes underlying disorders of menstruation, and even the pathology of endometritis, are as yet far from completely observed. The possession of a volume such as that before us, containing as it does, in 316 easily read pages, practically all we know about gynæcological pathology, cannot fail to act as a stimulus to workers in this field. Operators are slow to work up their specimens, partly for want of time, partly on account of the difficulty they experience in finding the literature dealing with the matter in hand. They will find the present volume a great help in overcoming the latter difficulty.

The author is to be heartily congratulated on the success which has followed his efforts to produce a good book, and one which, if kept up to date as future editions are required, will secure a permanent position in gynæcological literature.

W. E. Fothergill.

A Short Practice of Midwifery. By Henry Jellett, B.A., M.D., etc. Third Edition. London: J. & A. Churchill. 1901.

Dr. Jellett is to be congratulated on the appearance of a third edition of this work, which is one of the most excellent of the numerous short treatises on obstetrics which have recently been published. The author has very wisely made a change in this edition. The two previous ones were designed for the use of nurses as well as for students and medical practitioners. This had, as usual, an unsatisfactory result. Dr. Jellett has therefore enlarged this third edition, for the use of medical men, and has prepared a separate publication, revised and shortened, to suit the special needs of nurses. The work has been improved by the introduction of numerous new illustrations, and four new chapters have been added. The report of the Rotunda Hospital for the past two years is also given, and the essential features of the work which depend upon its connection with that hospital have been retained.

W. E. Fothergill.

Uterine Tumours. By W. Roger Williams, F.R.C.S. London: Baillière, Tindall, & Cox.

This publication may be considered as a compilation of cases cited and opinions expressed by various workers on the subject, and as such may be looked upon, as the author suggests, as a monograph, but there is wanting the foundation of observation acquired from large experience and original research, which necessarily detracts from its value. For example, after a by no means exhaustive account of cases of that much debated and interesting variety of neoplasm, deciduoma malignum, the author commits himself to the assertion that it is a variety of sarcomatous disease, without in any way discussing why he has arrived at this important conclusion. The strong opinion of most recent foreign authorities, that it is epithelial in its origin, is thus rudely set aside without any explanation.

From a clinical standpoint, however, the main weakness is apparent. The symptoms of fibromyomata are considered *en masse*, without the all-important classification of these tumours into their clinical groups of submucous, subserous, and interstitial. To any one accustomed to teach, the omission of such a classification is impossible, if an adequate knowledge of the symptoms of fibroids is to be explained. The clinical differences between a subserous and submucous fibromyoma may be as extreme as those between an ovarian cyst and a carcinoma of the cervix. The description of the electrical treatment of fibromyomata, by one electrode being placed in the vagina and the other on the abdomen, is surely a mistake, while the strength of the current, 50 to 60 milliampères, is greatly under-estimated. The adoption of the methods described will certainly not lead to advance the claims of this much abused yet valuable conservative method of treatment. While agreeing with the author, in his prefatory remarks, that from the vast amount of individual research, scientific and clinical opinions require to be unravelled and focussed by means of monographs, those alone appear to be valuable when, from a very large experience himself, the author is able to weigh the conflicting assertions made, and give convincing proof of the conclusions arrived at. F. W. N. HAULTAIN.

A Manual of Practical Anatomy. By the late Professor ALFRED W. HUGHES. Edited by ARTHUR KEITH, M.D. Part I. "The Upper and Lower Extremities." London: J. & A. Churchill. 1901.

THIS volume, which is brought out in a very attractive form, is the first of the three parts of Hughes' "Anatomy." Part ii., dealing with "the Abdomen and the Thorax," and Part iii., with "the Head, Neck, and Central Nervous System," are in the press.

Professor Hughes was so keenly interested in students of medicine, and was so attractive and successful a teacher, being himself deeply impressed with the extreme importance of the study of practical anatomy, that one expects to find his book essentially a student's book. The work is pre-eminently designed to assist in every possible manner the student, to attract him and to interest him in the subject, and at the same time to impress upon him the great importance of the careful practical study of the details of anatomy.

This first part, which contains just 270 pages of text, contains no less than thirty-eight coloured plates, and 116 figures in the text. Of the coloured illustrations twenty-four possess a special interest, as they are faithful reproductions of Professor Hughes' own dissections—now placed in the Anatomical Department of King's College, London. These have been drawn by Mr. M. P. Parker. The remaining fourteen plates are taken from Holden's "Osteology," and are intended to be consulted by the student and to assist him when working out the exact areas of the attachments of the muscles. The introduction of such illustrations into a practical manual is a good idea, and one that will certainly meet with the approval of students.

It is a matter of the deepest regret that the author has not lived to see completed the work, upon the preparation and carrying out of which he bestowed so much energy and enthusiasm. A. F. DIXON.

Atlas and Epitome of Special Pathologic Histology. By Dr. HERMANN DÜRCK, Munich. Translated by LUDWIG HEKTOEN, M.D., Chicago. Philadelphia and London: W. B. Saunders & Co.

THIS work consists of a series of 130 chromo-lithographs, illustrating the diseases of the circulatory and respiratory organs and of the gastro-intestinal tract. There is also a text which deals with the subjects of the illustrations. The attempt to render microscopic preparations in drawings, especially when these preparations are viewed with low powers, is a matter of great difficulty, and it is not to be wondered at if the results are somewhat unequal. It may at once be said that in this work the average of success is high. This is especially the case with the section treating of conditions in the lungs. Here many points which find scanty attention in even the larger works on morbid anatomy are dealt with in a very elucidating fashion. The least successful part is that treating of the spleen, where an attempt is made to introduce some order into the troublesome morbid anatomy of the organ. The text is of conspicuous merit, and often contains very suggestive passages. The book will be of use to the student who is reading up the preparations he has himself mounted, in enabling him to interpret the appearances he sees. It is to be hoped that the completion of the work may not be delayed.

James Ritchie (Oxford).

Chirurgische Technik. Vols. iii. and iv. By Professor von Esmarch and Dr. Ernest Kowalzig. Third Edition. Kiel and Leipzig: Lipsius & Tischer.

The present volume completes the authors' handbook of military surgery, and is devoted to the operations on the head, neck, and trunk. Every possible operation is described and illustrated. The text is concise, in parts laconic, but the reader has no difficulty in following it, for every procedure is made clear by excellent woodcuts and diagrams. Special mention should be made of the sections dealing with plastic operations on the face. The work is a very valuable one, and should be in the hands of every surgeon.

Operations-vademecum für den praktischen Arzt. By Professor Edmund Leser. Berlin: S. Karger.

This is a small book, intended for country doctors who must rely upon themselves, and who may require to revise the essentials of any operation before undertaking its performance. It is concisely written and profusely illustrated. Many of the operations described have no place in such a work, for they are not urgent, *e.g.* re-formation of the nose, resection of the fifth nerve for neuralgia, excision of the breast, etc. In the excision of joints the author has very wisely adopted the methods of Kocher. In Syme's amputation the common mistake is made of cutting the heel flap from the external to the internal malleolus, instead of to a corresponding point below and behind the latter.

Aexis Thomson.

Proceedings of the New York Pathological Society, for the years 1899 *and* 1900. New York. 1901.

This book contains the account of the work of the Society for last year. It shows that, roughly speaking, 100 different communications were read before the members, dealing with subjects extending over a wide field of medical subjects. Some of them are mere notes, and others are well worked-out papers of considerable completeness and merit. There are some good illustrations. Among the most noteworthy papers is one by Flexner, "On the Etiology of Tropical Dysentery," in which special attention is paid to the bacteriology of Philippine dysentery; another by Libman on "Sarcoma of the Small Intestine"; another by Lartiga on "Typhoid Infection of the Uterus"; several short communications by various members on inflammatory, hæmorrhagic, and necrotic conditions of the pancreas, and many other interesting and rare pathological conditions. The volume as a whole contains abundant evidence of the healthy interest and activity in pathological science shown by the members of the New York Pathological Society. R. F. C. Leith.

Handbook of Physiology. By W. D. Halliburton, M.D., F.R.S. Fourth Edition. (Being the Seventeenth Edition of "Kirkes' Physiology.") London: John Murray. 1901.

Still another edition of this well known text-book has appeared, but now bearing the new title of "Halliburton's Physiology." As the publisher rightly remarks in a prefatory note, it is but just that Professor Halliburton's name should appear on the title-page as the author, and not merely the editor, seeing that it is due to him that the book has been not only brought well up to date by the addition of new matter, but that the work as a whole has been almost entirely reconstructed. It is essentially a students' text-book, giving as it does a good general account of physiology and histology. A fair number of additions has appeared in this edition, practically all of them, however, dealing with the work of English physiologists—for example, Waller's work on the Electrical Currents of the Eyeball; Waymouth Reid on Absorption; Leonard Hill on Respiration under High Atmospheric Pressure, etc. The author is to be congratulated on the exceedingly satisfactory way in which he has collected and arranged the vast amount of subject-matter. The book may be taken as representative of the standard of physiology in the medical schools of this country, and may confidently be recommended as an exceedingly reliable students' text-book.

T. H. Milroy.

Compendium der Physiologie des Menschen. By Dr. Paul Schulz. Berlin: S. Karger. 1901.

This is a small but condensed students' text-book of some 350 pages, and is, as one would expect from the author, a carefully-written and well-arranged piece of work. It is, however, rather too condensed for an ordinary reader, and hence suffers in interest. It will probably be largely used by German students for examination purposes, but can hardly expect to gain many readers here. The author does not aim at any originality in treatment of his subject, contenting himself with giving an accurate, if brief, description of most parts of physiology, with the exception of histology, which is only referred to in its immediate connection with function. T. H. Milroy.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
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THE CLINICAL VALUE OF BLOOD EXAMINATIONS IN APPENDICITIS.

DA COSTA (*Am. Journ. Med. Sc.*, Phila., November 1901) caused estimations of the hæmoglobin, the red and white cells in the blood, of 118 cases of appendicitis, all of which were treated surgically, to be made before operation. Von Fleischl's hæmometer, enclosed in a light-proof box, provided with a camera tube to limit the field of vision to the mixing chamber, was employed in the investigation of the proportion of hæmoglobin present; the mean of several readings by several observers accepted as correct. A Thoma-Zeiss erythrocyte pipette, Joisson's diluting fluid, 1 part of blood to 200 of the fluid, Zuppert's counting-slide, represented the means used for counting the corpuscles; the red cells were enumerated in at least 200, the leucocytes in not less than 3600, small squares. In a few cases only was a differential count carried through.

Of the total 118 cases, thirty-eight, or 32·2 per cent., were of a simple character, *i.e.* unattended by suppuration, gangrene, or by general peritonitis; eighty, or 37·8 per cent., presented one or more of these complications. Showing the results obtained from the estimations of hæmoglobin and red corpuscles, in tabular form, the values are as follows:—

		Catarrhal or Interstitial Appendicitis.			Appendicitis cum Abscess, etc.		
		Acute (18 cases).	Chronic (20 cases).	Total.	Acute (76 cases).	Chronic (4 cases).	Total.
Hæmoglobin per cent.	Highest .	102	86	102	98	90	98
	Lowest .	45	60	45	38	48	38
	Mean . .	69	72·7	69·1	71·7	76·0	70·1
Erythrocytes (1000).	Highest .	5,660	5,620	5,660	5,710	5,240	5,710
	Lowest .	2,050	3,100	2,050	2,100	4,490	2,100
	Mean . .	4,240	4,348	4,186 (?)	4,372	4,925	4,400
Leucocytes.	Highest .	17,000	15,000	17,100 (?)	58,500	14,600	58,500
	Lowest .	1,600	2,400	1,600	6,000	8,800	6,000
	Mean . .	9,124	9,190	9,158	17,718	12,425	17,453

Thus the average case of appendicitis lacks about 30 per cent. of its hæmoglobin and half a million red corpuscles per cubic mm. In about 35 per cent. of catarrhal cases a moderate leucocytosis may occur; in 90 per cent. of purulent cases. Leucocytosis of pronounced character, 20,000 or over, almost invariably indicates pus or gangrene; if the white corpuscles range between 10,000 and 17,000, no deduction as to the nature of the local lesions is permissible. In some cases of mild, as well as of fulminating, appendicitis, no leucocytosis may be present; if after operation and evacuation of pus the number of leucocytes falls within a few days to normal, the probability is that further foci of inflammation are absent; if leucocytosis persists after the third or fourth day from the operation, such foci are usually present.

ACUTE LEUKÆMIA.

STEWART (*ibid.*, November 1901) records an interesting case of what may fairly be called "galloping" leukæmia, if the diagnosis given be accepted as correct. A married woman, æt. 28, on admission to hospital, was thought to be suffering from scorbutus, many of the symptoms of which disease were evident. These symptoms had begun two months previously. She was anæmic; her blood contained fewer leucocytes than the normal. Temperature at first 100°·4 F., on third day 103°·2 F., below 100° until the tenth day, when it gradually commenced to rise after the manner of the pyrexia of enteric fever, reaching 105°·4 fourteen days afterwards, to remain near 103° for other five days, until a large hæmorrhage from the bowel preceded exitus.

Several facts favoured the view that typhoid infection—"there was a great deal of typhoid fever in the wards at the time"—had supervened in a case suffering from scurvy. A rash over the abdomen developed, which at first resembled that of typhoid, but which later became purpuric and unlike the enteric eruption. The spleen, not palpable, but giving a slightly increased area of dulness on percussion at first, became readily palpable; diarrhœa set in; distension of the abdomen, and right iliac tenderness; while a specimen of blood procured on the day when the maximal temperature was recorded, the fifteenth from the commencement of gradual rise, was reported to give Widal's reaction. Five days later, examination of the blood gave the large number of 89,600 leucocytes, 1,280,600 red corpuscles, 25 per cent. hæmoglobin. Two days after this the leucocytes reached 162,000; and before death, two days later, another count gave a number considerably in excess of this, but the actual figure has gone astray. Diarrhœa latterly severe.

At the autopsy, several facts discovered went to disprove the possibility of typhoid fever having been the cause of death. It was sufficient for this to find the spleen large but firm; Peyer's patches practically unaffected; no ulceration of the small bowel, but numerous ulcers quite unlike those of enteric origin over the surface of the cæcum and colon. The abdominal and thoracic lymph glands were enlarged and firm; the intestinal mucosa and submucosa and many of the viscera contained numerous small leukæmic nodules. The pathologist's diagnosis reads: "An undoubted case of lymphatic leukæmia of the large mononuclear type." Dr. Thayer, to whom a specimen of blood was submitted for a differential count, agreed with this opinion. He had seen two very similar samples from very acute lymphatic leukæmia, associated in one case with hæmorrhages and cutaneous gangrene. He found the small lymphocytes to form 16 per cent., small mononuclear forms 22·4 per cent., large mononuclear cells 55·6 per cent., and polymorphonuclear type 6 per cent. of the leucocytes present.

The most interesting point attaching to the case is afforded by the hypo-leucocytosis found upon admission, and the severity of the leucocytic poisoning sufficing to cause death in exactly one month, and to infiltrate the viscera and tissues with enormous numbers of white corpuscular elements.

SURGERY.

UNDER THE CHARGE OF

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The Wearing of Gloves at Operations and the Infection of Wounds from the Atmosphere.

While all surgeons are agreed as to the necessity of reducing to a minimum the number of organisms gaining access to any wound, a considerable proportion are prejudiced against such refinements of technique as the wearing of gloves during operations. To these we cordially recommend the perusal of an interesting communication on this subject by Heile of Breslau. Having arrived at the conclusion that it is impossible by any method to get rid of all the organisms from the skin of the hands, Mikulicz adopted the practice of wearing cotton gloves at aseptic operations, not with the object of doing away with the necessity of disinfecting the hands as thoroughly as possible, but as a means of *further diminishing* the number of organisms introduced into the wound. Some of the hand bacteria may filter through the meshes, but the great majority are retained in the gloves. The author has investigated this question of permeability by a number of experiments. Having smeared his hands with a culture of the bacilli of rabbit septicæmia, he carried out a number of operations on rabbits, in one series with gloves and in another without them. The operation—a deep incision in the back along one side of the vertebral column, closed by sutures—was the same in all, and lasted exactly the same time, fifteen minutes; all the animals in both series died. An exactly similar set of operations was then performed, only the hands, after being infected, were mechanically washed for one minute, *i.e.*, very incompletely disinfected; under these conditions, the wearing of gloves made an important difference, for all the animals operated upon without gloves died, while nearly half of those in which gloves were worn recovered.

The importance of changing the gloves at intervals was shown by another series of experiments: if the same gloves were used for a number (four) of operations, one after the other, they no longer protected the wound from infection; whereas, if they were changed after each operation, the number of organisms which passed through the meshes became smaller and smaller. For the details of these and other experiments, the reader is referred to the original paper, but the author presents a strong case for the efficacy of gloves in diminishing the risks of wound infection so far as the hands of the operator and his assistants are concerned.

The next point investigated was the deposit of bacteria from the air of the theatre upon the surface of the gloves. The author estimated the number of organisms deposited from the air of the theatre by exposing large agar plates. The number varied with the disturbance of the atmosphere and with the presence and number of individuals in the theatre, whether participants or spectators. While on the days between operations only three points of growth resulted after half an hour's exposure, the number rose during an operation to sixty or more. The number of points of growth was materially increased by merely walking about the theatre, although clothed in an aseptic over-all, or by waving a sterilised towel so as to circulate the air and its floating particles. The number was remarkably increased after the entrance of spectators into the theatre. The effect of disturbing and separating dressings, in which discharge had dried by evaporation, was not only to disseminate organisms throughout the air of the theatre, but it was found that they tend to cling in large numbers to the coat of the operator, rendering the latter a carrier of infectious material. Every one who is to enter the operating theatre should put on an aseptic over-all, *immediately* before entering, and preparations for the operation should be made as far as possible in an anteroom, so as to disturb the atmosphere of the theatre as little as possible. The operator and his assistants must presistently avoid any contact with septic material, and must wear rubber gloves when obliged to operate or handle septic wounds or suppurating conditions such as appendicitis. In aseptic work, rubber gloves are not only a hindrance to manipulation, but may be a source of danger, for, if they are punctured or torn, the accumulated perspiration and bacteria of the hand escape into the wound. Cotton gloves are worn in all aseptic procedures, especially in the handling of ligatures and sutures, and they should be changed at intervals during the course of the operation.

Surgeons who have not personally tried operating in cotton gloves are apt to think they will interfere with their manipulations, whereas the contrary is the case; they give a better grasp of the instruments and especially of the ligatures and sutures. Doubtless they impair the accuracy of touch, for example in exploring the abdomen with the fingers introduced through a small incision; but for this purpose the glove is removed, the fingers are washed in saline solution, and are introduced into the belly; the necessary information having been obtained, the subsequent manipulations are performed with the gloved hands. In practice it is convenient to have several pairs of cotton gloves sterilised along with the gauze, towels, and over-alls in the metal drums in everyday use.—ABSTRACTOR.—*Centralbl. f. Chir.*, Leipzig, November 16, 1901.

TREATMENT OF TUBERCULOUS ADENITIS.

THIS was one of the two subjects set down for discussion at the French Surgical Congress recently assembled in Paris. M. Broca, who inaugurated the discussion, referred to the surgical treatment by means of parenchymatous injections and by extirpation. The former he considered the method of choice in the presence of abscess cavities, and he preferred iodoformised ether as the agent to camphorated naphthol. Extirpation is indicated when several glands are affected, where there are sinuses, and where there are large glandular tumours. Incision and scraping is reserved for semi-acute abscesses, resulting from mixed infections. M. Dernous maintained that one should differentiate from the point of view of treatment between the disease in children and that in adults, because, in the former, expectant measures often resulted in recovery. M. Berger advocated the repeated injection of camphorated naphthol in the suppurative form of glandular tuberculosis. M. Tédenat referred to the diagnosis of tuberculous adenitis from lymphadenoma, and declared himself an advocate of the extirpation of glands; he had seen fatal results from the injection of camphorated naphthol. M. Reynier did not have recourse to extirpation, unless after failure of the treatment by iodoformised ether; the former operation he described as a dangerous one, because of hæmorrhage and of the entrance of air into the veins; he had witnessed two deaths from the entrance of air and one from hæmorrhage. M. Duret, on the other hand, recommended radical extirpation, and was very satisfied with the results in his own cases. M. Boeckel placed extirpation in the first rank of curative measures, and has operated in 470 cases since 1892, with four deaths, one from secondary hæmorrhage, one from cerebral hæmorrhage, one from renal disease, and one from septicæmia. He distrusted scraping operations, because they favour the dissemination of the bacilli and yield unsightly scars. M. Championnière referred to the recurrence of the disease after extirpation as an important argument against this operation, and preferred injections of iodoformised vaseline and the external application of Napolitan ointment.

[We have instanced the views of the majority of those who took part in the discussion, as indicating the diversity of opinion regarding the treatment of tuberculous glandular disease among representative French surgeons—ABSTRACTOR.]—*Rev. de chir.*, Paris, November 1901.

GENERAL ANÆSTHESIA BY CHLORIDE OF ETHYL.

THIS agent is employed in several of the French Schools, and is most favourably spoken of. M. Malherbe records his experience in 170 cases. 2 to 4 grms. of the liquid are poured on a compress, and this is applied hermetically over the nose and mouth, to the exclusion of air. Complete anæsthesia is obtained in from twenty to forty seconds, and lasts three or four minutes. It may be prolonged by repeating the dose to fifteen or twenty minutes, and in the case of lengthy operations the chloride of ethyl is employed to start with, and the anæsthesia is continued by means of chloroform. Its chief advantages are the rapidity with which anæsthesia is induced, the absence of congestion or lividity, the almost entire absence of excitement and struggling, and the absence of salivation. It may be employed both in adults and in children. When the chloride of ethyl has been alone employed, there is no vomiting, and the patient awakes rapidly and is at once able to walk.—*Rev. de chir.*, Paris, November 1901.

Cocainisation of the Spinal Cord.

This method of inducing analgesia during operations continues to find favour amongst French surgeons. M. Guinard, who was for long prejudiced against it, has now become convinced of its excellence. He has modified the technique, so as to avoid the occasional undesirable accompaniments, namely, the intolerable headache, the pyrexia, and the syncopal attacks. Influenced by the researches of Ravout and Aubourg, he has given up water as the vehicle for the solution of cocaine, and employs the cerebro-spinal fluid of the patient who is the subject of the operation. He recommends the following procedure. The patient is seated with the legs dependent and the head inclined forwards. The skin is disinfected in the lumbar region. A point is selected in the middle line a finger's breadth below a horizontal line joining the iliac crests, and the skin is anæsthetised by chloride of ethyl. The left index is placed on the spinous process immediately above, and the needle, 8 cms. in length, is pushed in gently from below upwards. At a depth of 4 or 5 cms., there is no longer any feeling of resistance, and, on withdrawing the silver wire from the needle, 60 to 80 drops of cerebro-spinal fluid are allowed to flow into the sterilised receptacle. 6 or 7 drops of a concentrated solution of cocaine (1 cgrm. to 2 drops of water) are mixed with the cerebro-spinal fluid, the mixture is drawn up into a syringe, and injected slowly through the needle. M. Guinard has carried out this method in more than fifty cases without an unpleasant symptom.—*Rev. de chir.*, Paris, November 1901.

Statistics of Radical Cure of Hernia.

M. Lucas-Championnière has performed, during the last twenty years, 1030 operations for the radical cure of hernia, distributed as follows: 868 inguinal, eighty-two femoral, thirty-eight umbilical, fifteen epigastric, twenty-seven ventral. The results are best in inguinal hernia. There were only seven deaths among the 1030 operations, giving a mortality of 0·68 per cent. In inguinal hernia the mortality was 0·57 per cent. The deaths were due to hypostatic pneumonia (three cases), strangulation by band, tetanus, and hæmorrhage from the omentum. The longest series of operation without a death was one of 285 cases. A truss is only recommended after operation in exceptional cases. The proportion of relapses was much higher in femoral (four out of eighty-two cases) than in inguinal hernia (thirty-two out of 868 cases). He advises the wearing of a belt after operations for umbilical and ventral hernia, as in these the tendency to relapse is very much greater than in the other varieties. Inguinal hernia in women is always of congenital origin, and is capable of absolute cure by operation. Championnière never operates by Bassini's method. M. Berger, on the other hand, attributes the success he has obtained (one death in 900 operations) to the method of Bassini.—*Rev. de chir.*, Paris, November 1901.

Successful Removal of the Bladder and Sexual Organs for Vesical Tumour.

Hogge reports the case of a man, æt. 45, from whom he removed the bladder, prostate, seminal vesicles, penis, and testicles at one sitting, and he ureters were stitched into the rectum, but became separated and formed cloaca in front of the rectum. It was possible to catheterise the ureters rom this cloaca and to wash out the renal pelvis, which had become the eat of pyelitis. A year later, the ureters were again inserted into the rectum. At the first operation the rectum was separated from the prostate, seminal vesicles, and bladder; the symphysis pubis was divided, and the peritoneum stripped off the bladder; the bladder was then removed along with the sexual organs. Three years have now elapsed, and the patient remains quite well.—*Progrès méd.*, Paris, 1901, No. 4.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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INDICATIONS FOR PERFORMANCE OF CÆSAREAN SECTION.

Williams (*[redacted]at.*, N.Y., August 1901) publishes some interesting conclusions drawn from his experiences at the Obstetrical Department of the Johns Hopkins Hospital:—Out of 2123 cases of labour, 278 cases of contracted pelvis were noted. Spontaneous labour occurred in 71 per cent. of those cases. In cases where the conjugata vera measured from 9 to 10 cms., spontaneous labour occurred in 77 per cent.; between 8·9 and 8 cms., 61 per cent.; between 7·9 and 9 cms., 33 per cent.; under 6·9 no spontaneous labour occurred. In view of the perfection to which the operation of Cæsarean section has been brought, and the low maternal mortality (3 to 4 per cent.), Williams considers that the operation is absolutely indicated in all pelves the conjugata vera of which measure 7 cms. or under, and is generally indicated where the measurement is under 9 cms. The operation should not be performed for relative indications in cases where the mother's genital tract is septic: high forceps or version should be the method of choice in such cases; or, failing those, perforation is the proper operative procedure. In such type of cases where the absolute indication is present, Porro's operation should be employed.

Reynolds, in the same journal, condemns Cæsarean section when it is performed late in labour, or where the uterus is infected. Symphyseotomy, he considers, should be the operation of choice only in those cases where the pelvic contraction is such that the extraction of a living child is difficult or impossible, but after-symphyseotomy is safe and easy. Induction of premature labour in cases of contracted pelvis results in such an enormously high death-rate amongst the children, as to be unwarrantable in contrast to Cæsarean section when it is performed at the beginning of labour.

RETROVERSION OF THE UTERUS.

Webster (*Journ. Am. Med. Ass.*, Chicago, October 1901) describes a new method of operation in such cases. He opens the abdomen, then makes a small hole through the broad ligament and under the ovarian ligament, and close to the uterus. A pair of forceps is now passed through this hole, and the round ligament is grasped by it about 1 in. from its insertion into the uterus. The round ligament is now pulled through the broad ligament in a double fold, is carried across the posterior surface of the uterus a short distance above the utero sacral ligament, and stitched in this position with chromic catgut. The second round ligament is treated similarly. Webster claims for this method that pregnancy and labour is not interfered with, and that the normal mobility of the uterus is little if at all affected.

CÆSAREAN SECTION FOR THIRD TIME.

Wiener (*Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, April 1901) describes the following case:—Cæsarean section had been twice performed on a dwarf. As a result of the second operation, the wounds in the abdominal wall and uterus had reopened and suppurated, resulting in the formation of a utero abdominal fistula, which dried up after a time, leaving, however, a depression in the skin, the bottom of which was constantly choked with thick scabs. In January 1901 patient was admitted to hospital. She was then pale and anæmic. From the bottom of the old fistula a stream of blood, of the calibre of a knitting-needle, issued. The patient was very collapsed. A rapid examination revealed the fact that she was eight months pregnant, and that the conjugata vera measured 7·7 cms. The fœtal heart sounds were absent. Cæsarean section was at once determined on. The fistulous opening having been closed by forceps, the abdomen was opened. Numerous and firm adhesions existed between the abdominal walls and the uterus, the intestines and omentum. Those were dealt with, the uterus was opened transversely, and the child, which had recently died, was removed. Porro's method was now adopted, and the cicatricial tissue of the abdominal wall was removed. The wound was then accurately closed by sutures. Saline injections were freely used, and the patient recovered. The anterior wall of the uterus consisted chiefly of cicatricial tissue. The depression on the skin extended into the anterior uterine wall, but did not reach the cavity.

ECLAMPSIA.

A discussion on this subject is reported in the Ninth Congress (*Deutsche Gesellsch. f. Gynäk*). Fehling considered that all proffered hypotheses on the nature of the disease had proved untenable; all that now seems certain is that eclampsia is an intoxication of the maternal system, most probably of fœtal origin. Wyder discussed the clinical aspects of the disease; amongst the prodromata, he lays special stress on changes in renal secretion, such as reduction in amount of urine, presence of albumin, tube casts, blood, etc. Œdema, especially of the face, is worth attention. Other prodromata are disturbances of vision, sleeplessness, headaches, hyperæsthesia, fibrillary tremors. Rises of temperature during the course of the disease also occur. As regards prognosis, he regards the following as being the most important elements:—(1) The earlier the fits begin, the more unfavourable the prognosis. (2) The insensity, duration, and number of attacks, and the length of intervals between. (3) The depth of the coma, and the rapidity with which it supervenes after the onset of the attack. (4) The effect of the condition on the child; its death is favourable to the mother. (5) When pulse remains small in volume and rapid in rate, even between the fits, paralysis of the heart is probably impending. Treatment—(1) The use of drugs, such as chloroform, chloral, morphia, veratrum viride, which tend to poison the heart, should be as limited as possible, and regulated to suit each case. (2) The secretory functions of kidneys, skin, and alimentary canal should be stimulated, but in the least harmful manner. (3) Venesection in suitable cases, followed by subcutaneous, intravenous or rectal injections of normal saline solution. (4) Increase the oxidation of blood by the administration of oxygen. (5) Administration of stimulants, such as ether or strophanthin, in cases where heart-failure is threatened. (6) Deliver the woman as rapidly as possible; administer an anæsthetic, to lessen shock.

Schmorl noted the following pathological changes as the result of a very large number of cases in which he had made post-mortem observations:—

In the kidneys.—In nearly all cases cloudy swelling, occasionally necrosis of the epithelium, commonly thrombosis in the glomeruli, and in the smaller veins and arteries.

In the liver.—In nearly all cases cloudy swelling of the hepatic cells, as well as anæmic and hæmorrhagic necrosis.

In the lungs.—Thromboses of the pulmonary vessels were common, and often small hæmorrhages were present; fatty embolisms were of frequent occurrence.

In the brain.—In fifty-four out of sixty-five cases minute hæmorrhages and foci of softening were noted in the cerebral cortex, crus cerebri, and caudate nucleus.

In the heart.—In a large number of cases necrosis and small hæmorrhages were noted. His observations lead him to the conclusion that eclampsia produces a profound change in the blood, which results in the above phenomena.

In the children of eclamptics he found degenerative changes in the renal epithelium, and hæmorrhages in the liver.

Czempin regards the placenta not only as a system of blood vessels, but also as an organ which produces chemical modifications in the products of metabolism, and hence may be an important factor in the production of eclampsia. Löhlein, Geissen, and Herzfeld thought the pressure on the ureters was a predisposing factor in the causation of eclampsia.

THERAPEUTICS.

UNDER THE CHARGE OF

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New Observation on Cyclic Albuminuria.

Cyclic albuminuria affords the best opportunity for studying the influence of treatment on albuminuria, as it is possible to follow the results obtained. In cyclic albuminuria it is well known that in the horizontal position the albumin disappears, while on assuming the upright position it makes its appearance. Even during the latter period it is subject to great variations in amount. On the assumption that these variations depended on the mode of life, Edel minutely observed the urine of three patients for a period of several months. The first matter investigated was the fact discovered by von Noorden, that the urine in the forenoon was much richer in albumin than the urine during the afternoon. It is frequently stated that the taking of food has a bad influence on the albumin; but Edel finds that this is a mistake, and he proves that the afternoon freedom depends entirely on the digestion of the dinner. He found that the free period could be altered to any hour by moving the dinner-hour, and that, if no midday meal were taken, the afternoon urine did not become less albuminous. He comes to the conclusion that the diminution of albumin in the afternoon's urine is caused by the midday meal. In further investigations how this was brought about, he found that neither specific gravity, reaction, or amount of pigment had any relation to the albumin. On the other hand, he found that the albumin varied directly with the quantity secreted. Thus, when the urine was diminished and dark, the albumin was considerable, while in the free periods the flow was copious and the urine clearer. He therefore thought that the favourable influence of the dinner might be due to the increased diuresis. He was able to confirm this by omitting dinner and giving instead a diuretic. Thus pot. acetas during its action caused freedom from albumin, even though otherwise the condition was very unfavourable. As soon as the diuretic effect passed off, the urine became highly albuminous again. He was able to show that the absence of albumin is not due to mere dilution of the urine. To test whether the action was due to increased rapidity of circulation through the kidney, he experimented with hot baths in a fasting condition. He finds their action to be similar, namely, increased flow of clearer urine, with diminution, or even absence, of albumin. He then found that the horizontal position caused increased secretion of urine. Similarly, all the usual therapeutic measures which favourably affect the albumin, as alkalies, dietetic measures, show the same parallelism between increase in the urine and diminution of albumin. The second part of the paper is devoted to the investigation of those variations in the albumin which do not come under these explanations. Thus exceptionally the night urine contained albumin, and on occasion there was an abnormally large amount of albumin present. In these cases careful investigation showed that in some way the patient had over-fatigued himself, and that then he had a small inadequate pulse. Not until the pulse recovered did the urine return to its usual character. These observations induced Edel to pay great attention to the pulse. He found that at different periods the same movements had different effects on the pulse. Thus, when the pulse became small and weak, the albumin increased. If, however, by proper muscular exercises the heart and pulse were steadied, the patient passed a lighter urine free from albumin. Thus, if the patient during a period when he was excreting a maximum amount of albumin, with a weak, insufficient pulse, made regular muscular exertions, such as a military march, or better, climbing a hill, the pulse became steadier and the urine increased in amount, became lighter in colour, and ceased to contain albumin. If the exercise was indulged in till the patient was exhausted, or if it was not sufficiently regular in character, the improvement in pulse and urine was not obtained. Edel adapted these observations to the treatment of the patients. He instituted regular muscular exercises for strengthening the circulation, and ordered frequent small meals. The effect of this treatment was immediate. In the case of one of the patients, whose urine during daily observation for eight months had never been free from albumin for twenty-four hours, there was rapid decrease in the albumin. After five weeks' treatment, and then three weeks' hill-climbing in Switzerland, it was no longer possible to detect albumin. Simultaneously there was improvement of the pulse, which no longer had a period of weakness immediately after getting up in the morning. The exercises are being still carried out. Edel thinks that if the same factors are found in other cases of cyclic albuminuria, his method of treatment will be much more successful than the former treatment by rest in bed, which will only act in cases of acute exhaustion of the heart. To a certain extent a similar cycle can be observed in cases of chronic nephritis. It is most distinctly obtained in the case of nervous weakly people whose heart is only slightly resistant, and whose nourishment is weak. The more resistant and trained the heart is, the less is the daily variation noticeable. Edel has not yet made sufficient investigations on chronic nephritic cases to say much about the therapeutic effect on them, but he is pursuing his investigations.—Edel, *München. med. Wchnschr.*, 1901, Nos. 46 and 47.

LOCAL TREATMENT OF ULCERS RESULTING FROM INTUBATION.

BOKAY reports five cases successfully treated by O'Dwyer's plan. This consists in the use of a specially constructed bronze intubation tube, made with a slender neck portion and with a relatively deeper and thicker body. In using them, the narrow portion between the neck and body is covered with a coat of gelatin, and powdered alum is pressed into the gelatin while it is still soft. In this way a powerful astringent can be applied locally to the ulcers, which favours rapid healing. In O'Dwyer's original case three applications were necessary. Bokay reports five further cases where the diagnosis was ulceration from pressure. In these cases, at the end of 107, 108½, 124½, 142½, and 294 hours of intubation respectively, it was found impossible to remove the tube without causing alarming symptoms. After treatment with the alum-gelatin tubes for 70½, 72, 72½, 139½, and 147 hours respectively, extubation was accomplished. In one case the diagnosis of ulcer was confirmed by the subsequent development of a cicatricial stenosis. Bokay considers this treatment so simple and effective, that he recommends the method in all cases where the intubation has lasted for over a hundred hours, and there is reason to suspect pressure ulceration. By this means it will be possible, as a rule, to avoid secondary tracheotomy.—*Deutsche med. Wchnschr.*, Leipzig, 1901, No. 47.

INTRAVENOUS SALINE INJECTION IN DIABETIC COMA.

THE patient was a man, æt. 21, who had suffered from diabetic symptoms for two months. He was at first treated with restricted diet, without much effect. Afterwards increasing doses of uranium nitrate were tried, but with doubtful benefit. After two months' treatment the urine and sugar had been considerably reduced. Two days after the uranium nitrate had been increased from 3 to 4 grs. thrice daily, the sugar began to disappear, intermittently, from the urine. Associated with this there were anorexia, intense abdominal pain, sickness and vomiting. The pain was intermittent, and at times was associated with orthopnœa. Later there was restlessness and some delirium. Hypodermic injections of saline solution gave distinct though temporary improvement, and relieved pain. Next day the pain had returned, and there was varying mental condition, sometimes lethargy and delirium and sometimes normal intelligence. At midnight an alkaline injection of chloride and bicarbonate of sodium (1 dram of each salt to 1 pint of water) was made into the median basilic vein. This caused marked relief to the pain, breathing, and mental condition. Next day pain returned, and frequent vomiting occurred, so the injection was repeated in the afternoon, affording relief from the pain in an hour. There was persistent severe constipation and high acidity of the urine. The threatening symptoms passed off, and in a few days sugar reappeared in the urine, and the flow of urine rose again. Monro considers that this was a case of threatening diabetic coma, and considers that the treatment should be tried in cases where coma is suspected.—*Glasgow Med. Journ.*, September 1901.

TREATMENT OF TUBERCULOUS LUPUS BY POTASSIUM PERMANGANATE.

HALLOPEAU considers the recent advances in the treatment of this obstinate affection. He points out that in the majority of cases surgical intervention cannot be justified. As regards Finsen phototherapy, the treatment is prolonged indefinitely, as it is impossible to treat more than a very limited area at each sitting. He has therefore investigated Butte's claim, that the local application of potassium permanganate arrests the disease. He has been able partially to confirm this statement. In cases of ulcerated lupus the daily local application of a two per cent. solution has almost constantly more or less rapidily promoted cicatrisation, but he considers that this is due more to the distinctive effect of the disease itself than to the action of the drug. In non-ulcerated lupus the parts are washed, and the permanganate is applied in the form of a powder. This is allowed to remain on a quarter of an hour. It is then removed, but a certain amount is found to remain, attached to the nodules. In three or four days these particles are thrown off, leaving a red ulceration, which heals in the course of a few days. By the employment of these two methods of application it is possible to have, in the course of a few weeks or months, a complete cicatrisation, with disappearance of all projecting nodules. Vegetative masses and cheloid formations can then be removed. Still, Hallopeau does not consider the cure complete, as a careful examination reveals more thickening of tissue than can be wholly ascribed to the cicatrix; and in the cicatrix a certain number of reddish brown spots, which do not disappear under pressure. These are nodules not sufficiently acted on by the medication. He considers that the treatment promotes rapid cicatrisation of ulcers, removing superficial growths and cheloid formations, thus favourably influencing all the superficial manifestations, but that it lacks in penetrating power to have a curative effect on the deep lesions. He considers that the method should be employed to effect as much improvement as it can, and then, for the deeper manifestations, phototherapy should be tried. In this way a comparatively rapid cure could be obtained. This could be combined with intramuscular injections of sodium cacodylate.—*Bull. Acad. de méd.*, Paris, 1901, No. 34.

ANTHRAX TREATED WITH INTRAVENOUS INJECTIONS OF SILVER.

THE patient was a shepherd, who infected himself on the cheek. He was admitted to hospital in a serious condition, with extensive œdema and infiltration. He had repeated rigors. The only local treatment employed was application of boracic ointment. An injection of 5 c.c. of a 1 per cent. solution of silver was made into the cephalic vein. This caused some transient improvement, but next day the local condition became worse, so a second injection of the same amount was made. After the second injection marked improvement in the general condition, with lowering of temperature and lessening of tension and œdema. A further injection was given on the same evening. Next morning temperature was normal, and from this on recovery was uninterrupted. The patient was dismissed healed on the twenty-fourth day of hospital treatment, with the wound completely cicatrised. This case confirms the results observed in animals. The first effect of the silver is, after a few hours, rest and quiet sleep, then subjective improvement and sweating, and finally improvement in local condition. Fischer considers that had this case been treated by free incision the course of the disease would have been longer and the resulting deformity much greater.—Fischer, *München. med. Wchnschr.*, 1901, No. 47.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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EXTERMINATION OF RATS IN PLAGUE DISTRICTS.

THE recent outbreak of plague in Glasgow has been apparently traced to rats, and the evidence from other sources of their great influence in spreading the disease has rapidly accumulated during recent times. Authorities now regard them as the chief means by which the plague spreads from place to place, and their extermination in plague-threatened or stricken districts has become a question of the first importance. Bacteriologists have therefore sought for a germ capable of causing a fatal disease in rats and mice, or capable of easy transmission among these rodents without affecting the higher animals and man. It is obvious that the extermination of rats in confined spaces, such as holds of ships, is a comparatively easy problem, compared with their extermination in a town. Simple chemical means, such as the production of sulphurous acid gas, may be easy of employment and efficacious in result in the former case, but hopeless in the latter. Attack from the side of bacteriology seems *a priori* to offer promise of the greatest success. So far very little advance has been made in this direction, the chief being that by M. Danysz, published in the *Ann. de l'Inst. Pasteur*, Paris, April 1900. Löffler had isolated the *Bacillus typhi murium* from mice suffering from epidemic disease of natural origin, and found that it was fatal to field mice. His observations were corroborated by others, who found also that the organism in question was liable to show a great variation in virulence. Löffler's *B. typhi murium* was pathogenic only to mice (*M. musculus*) and field mice (*M. arvicola*); Laser's bacillus was pathogenic to *M. agrarius;* Merechkowski's bacillus to *Spermophiles;* Issatchenko's bacillus (all being modifications of the *B. typhi murium*), to white rats. Danysz set himself to widen the scope of action of this bacillus, and heighten its virulence so that it could attack other species of rodents, and lastly to maintain a continuance of this heightened virulence. He isolated a cocco-bacillus having a general resemblance to the *B. coli* and Löffler's *B. typhi murium*, from field mice suffering from an epidemic malady of natural origin. At the outset it was somewhat pathogenic to the grey rat (*M. decumanus*). He endeavoured to heighten its virulence by passing it through a series of rats, but found that this only diminished its virulence. In its earlier passages it might kill, but after the tenth or twelfth it rarely did so. The microbe has very little toxic power, and kills only after passing from the intestine into the system, where it multiplies enormously, and, in passing from one animal into another, it must go through this same alternation of medium, namely, from alimentary canal into blood; and in this may lie the explanation of its loss of virulence. He succeeded in heightening the virulence of the microbe by growing it in broth for twenty-four hours at incubation temperatures.

The broth must be inoculated with the blood of a mouse killed twenty-four hours after ingestion of a virus fatal in four or five days. A fresh broth culture is made from the first, and transferred to tubes, which are filled as full as possible, and, after being placed in the incubator until the culture has developed, are kept at room temperatures until a deposit forms in the tube, and the supernatant fluid is clear. This generally takes four or five days. The culture is then transferred in a collodion capsule to the abdominal cavity of a rat, and kept there for twenty-four or thirty-six hours. It is then transferred to broth, and again to a capsule. An agar culture is now made from this capsule. Bread or grain soaked in this culture is readily eaten by mice. This whole series of operations is repeated several times, and by the fifth or sixth passage such a notable increase in virulence is obtained that mice die in thirty-six to sixty hours after its ingestion instead of four to seven days. It should now be passed in a similar way through rats, young rats (a month or 6 weeks old) being at first used, and later rats of greater and greater age. Some ten passages generally suffice. He thus succeeded in rendering it consistently virulent first for the grey rat (*M. decumanus*), then for the black rat (*M. ratus*), and finally for the white rat, a culture which at the outset was but little pathogenic to the grey rat and quite harmless to the two other species. These cultures, when kept in tubes protected from air and light, maintain their virulence for several months. After raising the cultures to a degree of virulence such that they would kill all the rats kept in a cage in the laboratory within five to twelve days, he proceeded to try them upon rats in farms, shops, etc., with the general result that the rats disappeared in 50 per cent. of all the cases, diminished perceptibly in numbers in 30 per cent., and underwent no visible diminution in the remaining 20 per cent. He rightly observes that it is impossible to tell whether the diminution in numbers, when it does occur, is due to disease or merely to migration, for it is well known that rats quickly desert any spot when an unusually great mortality breaks out among them. He next had a certain length of sewer, 160 metres long and 3 metres wide, in the city of Paris placed at his disposal. He closed it on all sides, so that rats should be unable to escape from it. He then placed therein a plentiful supply of food and straw. On 2nd February he introduced 200 healthy greyish brown rats (*M. decumanus*), got from neighbouring sewers, into this closed sewer, and left them there under observation for twelve days. At the end of that time all the rats seemed healthy, and no dead body was found. On the same day, 12th February, the contents of twenty tubes of culture spread on small fragments of bread were distributed about the sewer. On 20th February an epidemic of disease broke out; whereupon a second distribution of virulent culture was made. The sewer was inspected daily thereafter, and eighty dead rats found up to 2nd March; forty of these were removed and examined. The others were left, and were eaten by their fellows within twenty-four hours of their death. All the rats examined were found to have the characteristic lesions of the disease (congestion of the intestine, hypertrophy of the spleen), and their blood gave pure cultures of the microbe. Eight live rats and some shapeless débris were all that were found in the sewer on 2nd March, and unfortunately these live rats were allowed to escape, so that the experiment could not be carried to its natural conclusion. He deduces from his results that—(1) rats at large in sewers readily eat bread soaked in cultures, notwithstanding abundance of other food being available, such as grain and carrots; (2) that they are attacked by the disease and succumb to it in large numbers; (3) that the survivors devour the dead bodies of those that have succumbed. Since the disease diminishes in virulence, and since certain individual rats have a greater resisting power, it is necessary to distribute fresh virulent cultures at intervals of ten or twelve days, to effect the destruction of even the majority of the rats in any place. Since young rats are much more susceptible than old ones, outbreaks will be more destructive in spring (April, May, June), and in autumn (September to December), than at other times of the year. Complete extirpation may be procured by systematic destruction during one or two years in succession. Experiments and trials were conducted simultaneously at Lille by Calmette, at Hamburg by Abel, at Copenhagen by Madsen, and at Tunis by Loir, with practically similar results. That this method would prove of use in a plague-stricken district is more than doubtful, and indeed it might lead to spread of the disease by plague-infected rats migrating elsewhere; but it might prove of signal service to a plague-threatened district if it were carried out simultaneously in different parts of that district. Much obviously remains to be done in perfecting this system or finding another still more efficacious.

The Plague.

Nathan (*Quarterly Rev.*, London, October 1901) has contributed a general article on the plague, which gives a remarkably good account of the disease, from the early histories up to the present time. Although written by a non-medical man, in a non-medical paper, its perusal will repay all interested in the disease, whether doctors or not. After describing the earlier history of the disease, he discusses its nature, symptoms, and dissemination. Only a few of the more important points brought out by him can be noticed here. As regards contagion, in the ordinary sense, he shows that in hospitals or private houses the disease seldom passes from the sick person to those around him. On the other hand, in dirty and ill-ventilated houses, the disease generally passes through most part of the household if not interfered with, and in such places doctors and attendants have sometimes caught the disease. The contagiosity of the disease varies much in different epidemics. Infection may be conveyed by the clothing, bedding, etc., but, generally speaking, the infectivity of such objects is soon lost. Direct sunlight kills the bacillus in an hour or less. Infected clothing packed up while damp, and secluded from light and air, may retain the infection for a considerable time. Vermin from the body or clothes may convey the infection. Cadaveric infection is not an important means of transmission, although it occasionally thus arises, for the bacilli in dead bodies lose their vitality after fourteen days or less. The general conclusion is, that while plague is not a highly contagious disease, in the ordinary sense, it is sometimes capable of passing directly from person to person; hence it would be very dangerous to treat it as if it were non-contagious. With regard to indirect means of transmission, there is no positive proof that the bacillus actually lives in the earth, like that of tetanus; but, on the other hand, there is no proof that this is not the case, and there are many circumstances which make it possible. Rats and mice are clearly affected by it. There is no doubt that human beings may acquire plague from rats. Men have caught it from handling dead rats, or from going to live in houses where rats had died, as in certain Indian villages, and occasionally, it is thought, through the intermediary link of cats. But there is still another way, which some think the commonest, by which the rat plague may pass to men, namely, by fleas. These pests abound on the bodies of rats, which, as is the custom of parasites, they desert after the death of their hosts. Dr. Simond has shown that fleas can carry the infection from rat to rat. The infection of man by this means is therefore clearly possible, and has in some instances being distinctly traced. The spread from one part of a town to another has been clearly traced to rats, and from one country to another by means of ships, as shown by the outbreak of plague in Sydney, New South Wales, in 1900. The Indian Plague Commission reported that, though theoretically possible, there was no evidence to show that this method of spread had actually occurred. Much evidence has, however, come to light since the publication of their report, and it may now be regarded as proved. There is therefore abundant evidence that rats suffer from a disease identical with human plague; that their epidemics for the most part immediately precede human epidemics; that they can transmit the disease to mankind; and that they can carry the infection about, within certain limits on land, and also by ships from one country to another. There is no proof that rats do actually receive the disease from men, though this is shown by experiment to be perfectly possible. In China, rats as well as pigs have been found devouring the corpses of men dead of plague; and the infection of the soil by human beings is an obvious means of transmission. All these facts lead to the hypothesis that the plague is primarily a disease of rats, and only secondarily a human disease. This was publicly stated by Koch at the recent Congress on Tuberculosis, but had been previously enunciated by Manson, and probably by others. Much has still to be discovered about the plague in rats. We do not know whether they derive the bacillus from the soil, or only from each other. The causes of the virulent outbreaks or epidemics among them are unknown, and it has yet to be made out whether any particular species of rats are especially or exclusively liable to the disease.

THE RELATION OF THE ENTEROCOCCUS TO THE ETIOLOGY OF TROPICAL DYSENTERY.

GREIG (*Indian Med. Gaz.*, Calcutta, August 1901, vol. xxxvi.) gives a short preliminary communication on this subject. He reviews the work previously done, referring the name enterococcus to Thiercelin, who described it as leading a saprophytic existence in normal stools. Simonin described its constant presence in a number of cases of dysentery which occurred in Paris. He separated it, and noted the close resemblance which it bears to the pneumococcus morphologically, both macroscopically and microscopically. Leukowicz (*Centralbl. f. Bak-*

teriol. u. Parasitenk., Jena, May 4, 1901, Bd. xxix.) describes carefully the pathological lesions produced by its inoculation. He looks upon it as the cause of non-tropical dysentery, to which he confines his observations, and possibly also of tropical dysentery. Its resemblances to the pneumococcus are very striking, and it differs from it mainly in its more rounded form, breadth, power of staining of capsule, and by forming longer chains in broth. The white mouse is the most susceptible animal. The lesion which the enterococcus produces is a local inflammation, with slight toxic or septic action, and agrees well with the clinical picture of dysentery. Greig's own observations are of a preliminary nature. He has found in the stools of a considerable number of acute dysentery cases an organism identical with that described above. His method was by "smears" on cover-glasses fixed in corrosive sublimate, and stained either by dilute fuchsin or by Gram's method. He gives two figures, showing the organism sometimes within the leucocytes and sometimes outside them. The resemblance to the pneumococcus with its capsule is at once seen to be very close. While he never failed to find it in the stools of patients suffering from acute dysentery, he did not find it in those of patients suffering from simple diarrhœa, and is inclined to look upon it as having a causal relationship to the former.

DERMATOLOGY.

UNDER THE CHARGE OF

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Favus.

Favus is the commonest of all the diseases due to parasitic fungi encountered in Poland, and the statement so made by Bernhardt of Warsaw (*Wien. Klin.*, September 1901) causes no surprise here, since a large proportion of the cases seen in Edinburgh are in poor, or at least ill-tended Polish Jews. In nine years, from 1886 to 1894, of 19,659 skin cases, seen at the Jewish Hospital in Warsaw, there were 3142 of favus, or 9·11 per cent. Bernhardt holds that there is but one fungus causing favus, but this exhibits the so-called "cultural pleomorphism"; this gives rise to variations, but not to differences of species. The scaly form sometimes shows a complication, the green colour imparted to the scales by the vegetation of *B. pyocyaneus.* The herpetic variety, when occurring on the trunk, without corresponding disease of the scalp, is difficult to discriminate from tinea circinata. The organisms are, however, much more numerous in favus in the scales than in tinea. In treatment he finds that alkaline ointments are best. Elsenberg has shown that slight alkalescence of the nutritive medium in cultures delays the growth of the achorion, a greater degree completely arrests it. Alkaline solutions of soda or borax, even 1 per cent., check its capacity for germination. Hence alkaline ointments, more particularly the following,—℞ Boracis, 10·0–20·0; vaselini, lanolin. anhyd., āā 50·0; talci pulv., 10·0.—*M. F. ung.*,—is used with good results. The method pursued is this. The scutula and scales are softened with some fat—lard, diachylon ointment, olive oil—in proportion to the amount of accumulation. With one of these the head is freely anointed at night, and covered with an indiarubber or other impermeable cap. In the morning the softened masses are wiped away with pledgets of wadding or scraped off with a spatula, then the head is washed with green soap and hot water. After drying, the hair is cut very short, and a simple salicylic ointment, or one with 5 per cent. balsam of Peru added, is rubbed in. Next day the head is again washed with soap and water, or douched with an antiseptic solution, such as 1 in 3000 of corrosive, and then epilated. But the scalp may, in consequence of a concurrent dermatitis from pediculi, perhaps, be swollen, reddened, and oozing. In such circumstances epilation is postponed, and some soothing salve, such as ung. plumbi, is applied till the inflammatory symptoms subside. Slight swelling and redness favour epilation, since the hairs are then extracted easily and almost without pain. Forceps are used, and each hair is seized singly, close to its root, and drawn upon in the line of its axis. Not only the diseased but also the healthy hairs, for half an inch circumferentially, are removed. After each daily sitting some antiseptic salve (carbolic, salicylic, sulphur, balsam of Peru, tar, or borax) is rubbed in, in accordance with the state of the scalp. The daily successive procedures are—(1) washing with water and green soap; (2) epilation; (3) inunction with parasiticide. When the epilation is completed it is repeated, and usually this suffices, but the head must be kept for a long time scrupulously clean by daily ablutions. Obstinate cases need three or even four epilations. The affected areas remain persistently brownish red and slightly scaly. To remove this, if there is much infiltration, glycerin containing iodine is to be painted on daily, or, if scaly, then 20 to 25 per cent. of oil of cade in olive oil. Even then cases must be kept under observation for a considerable time, and any suspicious spots treated, should such be found.

EXPERIMENTAL OBSERVATIONS ON THE ETIOLOGY OF ECZEMA.

Bender, Bockhart, and Gerlach (*Monatsh. f. prakt. Dermat.*, Hamburg, August 15, 1901) have instituted a series of inoculation experiments, in order to discover the relation between the yellow and white pus cocci and eczema. They did not try to isolate, cultivate, and inoculate a possible special eczema microbe, and their results do not bear on that question. If pure cultures of the pyogenic staphylococci are inoculated into the human skin, the effect of the staphylococci themselves, or still more the poison contained in the living bodies of the staphylococci, must be distinguished from that of their toxines. The toxine employed was that contained in the filtrate from soup cultures. As the cocci alone produce a different effect on the human skin than the toxine, they must be introduced separately. The first conclusion they arrived at was, that while virulent cultures of the *Staphylococcus pyogenes albus* and *aureus*, inoculated on a previously irritated human skin, may give rise to impetigo, folliculitis, or boils, such never produce eczema. Again, isolated virulent bodies of staphylococci, with which no toxine is combined, similarly introduced, cause impetigo but not eczema. But the filtrate of old soup cultures of staphylococcus is poisonous for the skin. Such can evoke on skins, whether irritated or disinfected or not, a typical acute, papular, or vesicular eczema, if applied in the form of moist warm compresses for twenty to forty-eight hours. The primary eczema vesicle under such circumstances is sterile. The older, with sero-purulent contents, exhibits pure specimens of *Staphylococcus aureus* or *albus*. Hence it is not the staphylococci themselves which occasion eczema, but their toxine. They explain this as follows. The bodies of the staphylococci contain a chemiotactic poison, which develops a leucotactic effect, so arises pustulation or abscess. But the staphylotoxine containing leucocidin, acts destructively on the leucocytes, is negatively chemiotactic. The staphylotoxine is more powerful than that contained in the staphylococcus bodies, checks the attraction of leucocytes, while having the power to excite eczema by itself. Bockhart, however, was not fully satisfied with these results, and consequently carried out further investigations (*ibid.*, November 1, 1901). He first discovered that occasionally inoculations with the staphylotoxine gave rise to constitutional disturbance as well as eczema. Then, that not all of the freshly developed vesicles of a staphylotoxine eczema were sterile and contained clear serum. Some showed milky contents, and, from the commencement, some leucocytes and staphylococci. He therefore drew the following conclusions:—Eczema is an infectious inflammation of the epidermis, and is caused by staphylococci. The healthy cutaneous follicles of a predisposed person may contain living but inactive staphylococci. These staphylococci may, owing to some external or internal cause, which improves the nutritive material for the cocci in the follicle, have their virulence increased. A sequence of the more active metabolism of the cocci is the excretion of staphylotoxine. So soon as this toxine becomes diffused in the epidermis, it, by virtue of its serotactic power, generates papules and vesicles in the epidermis. These, if over the follicle, contain serum and staphylococci. Those in the immediate neighbourhood of the follicles contain clear serum, and at first no staphylococci; they remain for a time sterile. The staphylococci in the vesicles at the mouths of the follicles increase, and leucocytes appear, and secondarily infect the neighbouring hitherto sterile vesicles, by way of the canals in the œdematous epidermis. Whether the vesicles afterwards become pustular or remain leucoserous, depends on the plasmin in the staphylococci. The ruptured vesicles and the weeping eczematous surface and its vicinity may be infected by staphylococci containing much staphylococci plasmin. Then arise the purulent complications of eczema, impetigo, and furuncle. Should the eczema not heal, but become chronic, other tissue changes in the corium and subcutaneous tissue appear, not caused directly by the staphylococci. These observations, therefore, go to support the much disputed theory of Unna as to the parasitic nature of eczema, which Bockhart regards as in the main correct.

LICHEN PLANUS AFFECTING THE NAILS.

THE more one studies lichen planus the more one is struck by the multiplicity and the variety of the lesions present in individual cases. Still, up to this time, no one has recorded an example of disease of the nails attributable to it. The instance related by Dubreuilh (*Ann. de* *dermat. et de syph.*, Paris, July 1901) has therefore special interest. A man of 50 had on his limbs the characteristic papular eruption. But besides this, the dorsal aspect of the distal phalanx of each finger was swollen, and of a deep dull red. On this were a number of punctiform depressions, filled with a horny plug, and apparently corresponding to the orifices of the sweat ducts. The epidermic cushion at the root of the nails was thickened. The nails themselves were finely striated longitudinally; the lines being deep, contiguous, and parallel, were scarcely more than ⅓ mm. in breadth, and were occasioned by the splitting lengthwise of a narrow ridge. The nail looked rough, and as if it had been scraped with a file or coarse sand. The general form was preserved; they did not seem thinned, but were said to break readily. The attachment to the bed was normal, but under the free border of each nail, on the little finger, was a mass of hyperkeratosis of the bed, of a brownish tint. Cacodylate of soda was first prescribed, then Fowler's solution, which, even in reduced doses, was followed by symptoms of arsenicism, and was eventually replaced by iodide of potass. Four months later, while the front portion of the nails still showed streaking, the more recent part, over the lunula, and near the matrix, was nearly natural in aspect. The eruption on the limbs had faded in great measure, though some new papules had arisen.

THERAPEUTIC NOTES.

ROHLEDER strongly recommends (*Berl. Klin.*, August 1901) a 25 per cent. naftalan soap, superfatted to the extent of 2 per cent., in the following conditions:—(1) As an auxiliary in ordinary treatment by ointments, at the time of changing the dressings; to cleanse the diseased skin in chronic eczema; as a preliminary to wash with in such cutaneous disorders as present a dry, brittle, scaly surface, as in psoriasis, lichen pilaris, or pityriasis rosea; also in the ablutions in scabies before rubbing in the curative salve. (2) As by itself remedial in dry, scaly eczemas, which have long ceased to weep, particularly on spots where pastes or spread ointments are difficult to apply; in post-scabious dermatitis; in the slighter dermato-mycoses, such as pityriasis versicolor; in chapped hands, where the skin is very irritable; and in impetiginous processes. (3) Especially as a prophylactic, where a harmful agent is present in the occupation, whether this arises from chemicals, too frequent washing, or other factors, as in the case of doctors, midwives, photographers, nurses, etc.; for daily use where washing may lead to eczema of the hands or face during severe weather or in winter.

Arning (*Monatsh. f. prakt. Dermat.*, Hamburg, October 1, 1901) lays down some excellent rules for the treatment of furunculosis. He points out that there are certain axioms to be borne in mind. Every furuncle is a culture-ground for staphylococci, and in its process of evolution endangers, not only the immediate neighbourhood, but wider regions, through the deposition of the germs on the skin or in the lymph spaces. The treatment of each boil must be early; if instituted before the fourth or fifth day after its appearance, its abortion is ensured. External irritants must be got rid of, and any existing disturbances of the system are to be sought out, and, as far as possible, obviated.

To cleanse the part, benzine suits best, but no special disinfection of the skin, in the surgical sense, need be carried out. If the boil has burst or has been opened, the crater must burn itself out; we can only protect the surrounding parts. If still entire, then abortive measures are feasible. The glowing red fine platinum point of a thermo-cautery should be plunged into the centre. The sensation indicates when one has pierced the thickened cutis, and has entered the necrosis. The pain is less than that of incision. If the proper depth has been reached, the special pain of the boil at once ceases. In larger or carbuncular boils, several punctures should be made, at least where bursting threatens. The size of the opening should correspond with that of the furuncle. If on a part covered with clothes, or if the area round is irritated, a tumenol varnish is to be painted on, to which anthrarobin is added if seborrhœa coexists. ℞ Anthrarobini, 2·0; tumenoli, 8·0; æther. sulph., 20·0; tinct. benzoini, 30·0. A bit of chinosol gauze may be put over the boil itself, and over all a piece of 2½ per cent. salicylic tricoplast. If the region is a hairy one, the hairs are not to be cut too short. To protect the integument, baths of creolin, three-quarters of an ounce in a large warm bath, give the best results. Then, after puncturing with the paquelin any commencing point, the following paste may be smeared on:—℞ Sulph. ppt., camphoræ, āā 1·0; acidi borici, 8·0; zinci oxidi, amyli trit., āā 20·0; vaselini ad 100·0.

Winkler (*Monatsh. f. prakt. Dermat.*, Hamburg, October 15, 1901) praises epicarin—a condensation product of creosotinic acid and naphthol —as an excellent remedy in seborrhœa capitis, and in the thinning of the hair resulting therefrom. ℞ Epicarini, 5·0; æther. sulph., 15·0; sp. vini gallici, 80·0.—*M.* The hair is divided and the spirit rubbed in the scalp daily. It is not necessary to wash the head previously with spirit of soap. If too much is employed, the hair becomes brittle and the skin harsh, owing to removal of the oil. But, on the contrary, smaller amounts of epicarin add to the lustre. In chilblains, also, it is advantageous. It acts both as an antipruritic and on the blood vessels, and he has had good results in the erythematous and in the ulcerated stages alike. ℞ Epicarini, 3·0; saponis virid. kalin., 0·5; ung. caseini ad 30·0—*M. F. ung.* This produces a semi-solid ointment of a reddish colour, which keeps well. The dry smooth coating so formed on the part should be daily removed in a warm bath, and, after careful drying, renewed. The itching and burning cease at once, the pain on pressure lessens, the erythema fades, and the ulcer speedily heals.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

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'THE BLOOD OF INFANCY AND CHILDHOOD.

AT the Pepper Laboratory of Clinical Medicine, Philadelphia, Stengel and White have made a series of investigations regarding the blood of infants, of which the following is a brief abstract:—The red blood corpuscles are more numerous at birth than in normal conditions in after life. The average of the enumerations of various investigators is 5,742,080 per cmm. Certain conditions are supposed to influence the number of cells. Thus, according to Hayem and Helot, it has been found that when the umbilical cord was not tied until its pulsations had ceased, a greater number of red corpuscles was found than in cases in which immediate ligation was practised. Elder and Hutchison, in comparing the blood of the new-born infant with that of its mother, found that the former was always richer in the number of red corpuscles, the difference being as much as 350,000 to 500,000 per cmm. The number of red blood corpuscles begins to fall after the second day, and the decrease in the number continues during the first year, and then there is an increase up to the eighth or twelfth year, when the number becomes approximately that maintained until adult life. The count of the two sexes is approximately the same before puberty and after the menopause, but in the intervening years the count in the woman is apt to be lower than in man. The red blood corpuscles at birth vary greatly in size, and the hæmoglobin is not so firmly attached to the cell stroma in the new-born infant. The hæmoglobin is increased at birth, but tends to decline rapidly during the first few days of life. Rieder's experiments showed an excess of from 25 to 30 per cent. at birth. The specific gravity usually varies as the percentage of the hæmoglobin varies, so that at birth the specific gravity is larger, and subsequently it declines. Taking the average of various investigators, it was found to be 1063 at birth, declining to 1052 at two years. The white blood corpuscles are greater in number at birth than in the adult blood; this excess in numbers constituting what is known as the leucocytosis of the new-born. During the first two days there is an increase in the number of the leucocytes, after which the number declines though the count still continues higher during the first and second years than that found in the blood of the adult. After the second year the number gradually declines to that found in adult blood. Physiological influences, such as diet and digestion, have about the same effect on the leucocytes in the infant as in the adult, causing a digestive leucocytosis, but as the feedings of the infant are so much more frequent this leucocytosis is practically constant. With regard to the variety of the leucocytes, the most striking peculiarity is the increase in the number of lymphocytes, and the more or less proportionate decrease in the polymorphonuclear cells. The weight of the child has apparently no influence either on the total number of leucocytes or on the proportions of the different forms. Daily variations of temperature have no influence on the number of leucocytes. The eosinophile cells vary very greatly in number at birth, sometimes being diminished and at other times greatly increased in numbers. Nucleated red corpuscles are the embryonic type of the normal erythrocyte, and until the sixth month of intra-uterine life form the greatest number of the red cells of the blood. From this period until birth they gradually decline in number, and at birth only a few erythroblasts are found. By the end of the second day they as a rule entirely disappear, except in children who are ill.—*Trans. Am. Pediat. Soc.*, vol. xii. p. 214.

AN EPIDEMIC OF NOMA.

IN April 1900 an epidemic of measles occurred at the Albany Orphan Asylum. There were in all 173 cases of measles of a very severe type, and in sixteen cases the complication of noma occurred, a number sufficient in the estimation of the writers to entitle the outbreak to be called an epidemic. Of these sixteen cases the mouth alone was affected four times, the vulva twice, and the rectum three times, while in the remaining cases several parts of the body were simultaneously attacked. The ages of the children affected varied from 2 to 12 years. The predisposing cause of the epidemic was undiscovered, as the lodging, food, and general hygiene of the children, which are generally held responsible for the origin of this condition, were in all respects satisfactory. In the sixteen cases here reported all the cases developed in the girls' dormitory, except two cases in boys who were in the infirmary where cases of gangrene were being treated. Although there were almost twice as many cases of measles among the boys as amongst the girls, no cases of noma developed in the boys' dormitory. It was noted also that, after the cases were thoroughly isolated, no new cases developed. This disease began with a slight ulceration of the mucous membrane with a surrounding area of intense hardness. This quickly became dark and broke down, the process being accompanied by an intensely offensive odour. The process was in some cases so rapid that it seemed to necrose *en masse*. No complaint of pain was made by the children, and the washing and dressing of the ulcerated surface did not cause distress. The general treatment was stimulating—alcohol, strychnine, combined with concentrated nourishment. Locally, frequent douching with boric acid solution and then with pure peroxide of hydrogen, and constant dressing with Labarraque's solution, was employed. When the destruction was not too extensive, thorough cauterisation, under chloroform, with the Paquelin cautery, seemed to stop further progress. Nine of the sixteen cases occurring in this epidemic were examined bacteriologically. They were selected as cases which showed all the different stages of the process. The examination included cover-slip examinations in all cases, and cultures in blood serum agar and bouillon grown aërobically and also in the Buchner jar. As a result of the investigation and an analysis of the literature, it must be concluded that noma, while originating in all probability as a simple infection, is always, in its later stages, a mixed infection, and that while it is not always caused by the same organism, it is most frequently due to a long thread-like organism of the leptothrix type, which does not grow upon ordinary culture media. Krahn's assumption, that it is due to the mouth organisms, is negatived by finding similar organisms in noma of the genitals.—*Am. Journ. Med. Sc.*, Phila., Nov. 1901.

A NEW SIGN OF INFANTILE PNEUMONIA.

PROFESSOR WEILE (in *Rev. des malad. l'enfance*, Oct. 1901) calls attention to a sign of infantile pneumonia which he has observed, and which he maintains is nearly constant. It consists of a marked want of expansion, below the clavicle, of the affected side. He has carefully examined for this sign in all respiratory affections of children, but has only found it in pneumonia. In pneumothorax and pleurisy the expansion of the affected side is embarrassed, but in these conditions either the whole side is implicated or the part of the thorax only corresponding to the extent of the lung involved. On the other hand, the writer maintains that in pneumonia the want of expansion is limited to the infraclavicular region, even when the pneumonia is completely confined to the base. He affirms that it is an early sign, showing itself in the first few days, and lasting till the termination of the malady. The precocity of the sign is its great value, for it is present when other physical signs of pneumonia are too frequently absent, and when the condition is often mistaken for some other affection. The writer, by an early recognition of this sign, has frequently diagnosed the onset of pneumonia in cases of typhoid meningitis and other diseases. He states that the difference of expansion is very apparent, and that it can be as readily recognised by inspection as by palpation.

HYDROCEPHALUS TREATED BY TAPPING, AND BY THE INTRODUCTION OF ASEPTIC AIR IN PLACE OF THE FLUID.

IN *Pediatrics*, October 15, 1901, Drs. Lee and Dickinson describe the induction of artificial pneumocephalus as a method worthy of trial in chronic hydrocephalus. They modified the old operation of tapping in such a way as to obtain complete evacuation of the fluid, by allowing aseptic air to take its place. The following method was adopted:—In addition to a Southey's cannula and indiarubber tubing, acting as a drain, a second Southey's cannula, provided with a sterilised indiarubber tube, was employed. The free end of this second tube was connected with the nozzle of a small glass syringe, from which the piston had been removed, the broad end of which was plugged with cotton-wool after sterilisation. The two trochars were then ready for introduction into the fontanelle, with antiseptic precautions, and with careful avoidance of the vicinity of the sinus, the site for the outflow puncture being selected at a short distance below that for the air supply, and too great a rapidity of outflow being guarded against by a regulating small screw-clip. The operation was successfully carried out in two cases with a considerable output of fluid, marked reduction in the size of the head, and cessation of pressure symptoms. In the first case eight tappings were performed in six months, the largest amount collected at one tapping being 50 oz., corresponding probably to the ventricle capacity. The condition of the child after the eight tappings and the removal of 11 pints of fluid is described as on the whole satisfactory. Mechanical relief from pressure has for corresponding periods been afforded to the brain substance; the comfort derived from the operation was manifest and apparent even to an untrained observer. The general nutrition and body weight improved, a tooth was "cut," and the hydrocephalic cry ceased. Adverse symptoms consisted in some collapse, which occurred at the first tapping, owing to the fluid being allowed to escape too rapidly; temporary symptoms of ocular and facial paralysis, and increased rigidity suggesting transient irritation of the membranes. In the second case one tapping only was performed, and 6½ oz. of fluid were drained away, for which aseptic air was substituted. The effect was entirely beneficial, and reaccumulation of fluid did not take place.

REPORTS OF THE MEDICAL SOCIETIES.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY, *December* 4, 1901.—Professor T. R. FRASER, President, in the chair.—Drs. W. ELDER and MILES showed a patient after removal of a tumour from the left prefrontal lobe of the brain.—Drs. LOVELL GULLAND and LOGAN TURNER showed a patient after operative treatment for laryngeal tuberculosis.—Mr. SHAW M'LAREN showed a patient after recovery from compound depressed fracture of the skull and lepto-meningitis. — Dr. WM. ELDER and Mr. MILES showed a tumour removed from left prefrontal lobe of the brain.—Dr. F. D. BOYD showed the bowel from a case of acute dysentery.—Dr. BURN MURDOCH showed large gall-stones which produced practically no symptoms.—Mr. ALEXIS THOMSON showed a large gall-stone which caused acute intestinal obstruction, and was removed by enterotomy. — Dr. HARVEY LITTLEJOHN showed — (1) Surgical instruments used by natives of Northern Nigeria. (2) Kidney and ureter, showing effect of accidental ligature of ureter for removal of intra-ligamentous ovarian cyst. (3) Injuries received in a fall from a window twenty-five feet high.— Mr. W. CATHCART showed—(1) A toy whistle removed from the trachea of a boy, æt. 9, after being six weeks in the air-passages. (2) Portions of needle and thread, also Röntgen-ray photograph of same, removed from the knee of a girl, æt. 7.—Mr. CAIRD showed—(1) Carcinoma of ascending colon, from a case of primary resection and suture. (2) Lung preparations (method of Buchhold).—Dr D. C. WATSON showed photographs of poultry, showing some results of an experimental research on the comparative pathology of gout.—Mr. DAVID WALLACE showed Beckmann's apparatus for ascertaining the freezing-point of blood.—Dr. DAWSON TURNER—(1) Apparatus for measuring the electrical resistance of blood. (2) Note on the Röntgen rays in syphilis.—Dr. LAWSON of Nordrach-on-Dee read a paper on "Some Clinical Observations upon the Temperature of Phthisis," based upon experience of one hundred consecutive cases treated by open-air methods. Dr. Lawson first described his method of recording temperature, pulse-rate, and weight. He took the highest and lowest points of every four consecutive days and averaged them. The average charts thus obtained gave the amplitude, which decreases in favourable and increases in unfavourable cases. The temperature and weight should improve together. In unfavourable cases a patient may gain weight and yet be rapidly getting worse. The diazo reaction in the urine is a very unfavourable sign. The temperature of phthisis presents two features—inelasticity and instability. By inelasticity is meant the fact that the temperature does not readily fall after the exciting cause is removed, *e.g.* the hill-climbing test. By instability is meant that the temperature is easily raised by slight causes, such as an attack of indigestion, variation in temperature of the atmosphere, and excitement. Excessive heat of the air may cause a very considerable rise. In the taking of temperature Dr. Lawson strongly advocated the rectal method, because (1) external influences are not important; (2) the temperature is higher, absolutely and relatively; and (3) because it is more sensitive. The temperature is the best guide as to the effect of treatment, and should be taken regularly and frequently. As a rule, the temperature is highest at 2 a.m., and lowest in the evening. An inverse temperature range is a very bad type. Faulty temperature records are responsible for many errors in diagnosis. Exercise in a healthy individual may raise the temperature, but it quickly falls again to normal; in the tuberculous subject exercise may cause a fall,—as, for example, in fibroid phthisis, the fall being due to exhaustion,—or it may cause a rise, and this rise takes a longer time to fall than in the healthy. In a favourable case the temperature should fall again in an hour. In considering a case, an all-round view of it should be taken, the temperature, pulse, weight, and condition of the lungs being all fully considered.—Mr. D. **WALLACE** read a paper on "Suprapubic Prostatectomy, with Notes on Eleven Cases." This operation is said to be a dangerous one *per se*, but Mr. Wallace has not found it so. The mortality of castration and vasectomy is as high as that of prostatectomy. Suprapubic operation is much better than the perineal, because inspection is easier and the size of the prostate does not interfere, and further procedure can be adopted. It is impossible to remove the prostate without opening the urethra. Prostatic hypertrophy is of three kinds — vascular, fibrotic, and fibro-adenomatous. Catheter life should be initiated before atony of the bladder sets in: if there be much difficulty in using the catheter, castration should be performed. In later cases where atony has set in, or where there are complications, the suprapubic operation should be performed. Bleeding is easily arrested by washing out freely. Sprengel's pump, as modified by Mr. Cathcart, is the best method of draining the bladder. Of eleven cases operated on, five were cured, three improved, one relapsed *in statu quo*, two were done quite recently, so it is too early to pronounce on them.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY. — CLINICAL MEETING, *December* 18, 1901.—Dr. **ANDREW** in the chair.—Mr. **CATHCART** showed a patient after drainage of both pleural cavities for double empyema.—Dr. W. **ALLAN JAMIESON** showed—(1) A case of lupus vulgaris treated by means of the Finsen light treatment, and apparently cured; (2) case of rodent ulcer treated by X-rays.—Mr. **MILES** showed—(1) A patient after operation (posterior gastro-enterostomy) performed for severe hæmatemesis due to a gastric ulcer situated close to the pylorus; (2) a patient after operation for intestinal obstruction due to tuberculous peritonitis, subsequent development of tuberculous pleurisy, which was treated by drainage (operations August and October 1898); (3) patient after excision of the rectum by Kraské's method.—Dr. W. G. **SYM** showed a patient on whom double excision of the lachrymal sac was performed, followed by extraction of cataract in one eye.—Mr. **STILES** showed—(1) A boy after operation for recurrent tubercle and stricture following amputation of the penis for tuberculous disease of the glands; (2) child, æt. 14 months, after operation for congenital malformation of the anus; (3) several patients, showing the results of treatment of congenital wry-neck by the "open operation," which consists in exposing the muscle and dividing it and the subjacent fascia.—Mr. ALEXIS THOMSON showed a female patient, æt. 52 years, the pyloric portion of her stomach having been removed for cancer three and a half years ago.—Mr. CAIRD showed a patient after operation for high shoulder, due to an osseous plate developed between the scapulæ and vertebral spines.—Mr. MILES showed—(1) Rectum excised for malignant disease by Kraské's operation; (2) specimens of præputial calculi; (3) specimens illustrating fracture dislocation of the spine.—Mr. CAIRD showed—(1) Specimens and photographs from case operated on for high shoulder; (2) carcinoma of transverse colon, from a case of resection and primary suture.

EDINBURGH OBSTETRICAL SOCIETY.—*December* 11, 1901.—Dr. JAMES RITCHIE, President, in the chair.—Dr. BERRY HART showed—(*a*) A large fibroid which had burrowed between the layers of the meso-rectum; (*b*) two tuberculous kidneys, one removed by abdominal section, the other by lumbar nephrectomy; (*c*) an ovarian tumour with twisted pedicle.—Dr. MILNE MURRAY showed—(*a*) Two early chorionic sacs; (*b*) the entire gestation sac from a case of placenta prævia at the seventh month.—Dr. LAMOND LACKIE showed an ovarian tumour with a twisted pedicle.—Dr. HAULTAIN showed the uterus from a case of hæmatometra.

COMMUNICATIONS:—Dr. MILNE MURRAY read a paper on "A Case of Spontaneous Rupture of an apparently Normal Uterus at the Commencement of Labour." He first of all referred to the various conditions under which rupture of the uterus occurs. He then described a case in which none of the ordinary conditions supposed to favour rupture seemed to be present. When Dr. Murray saw the patient he found her in a condition of collapse, and on examination under chloroform he determined that the child was in the abdominal cavity, and per vaginam an extensive rent in the uterus wall could be detected. Though the chances of recovery were remote, Dr. Murray decided that abdominal hysterectomy was the only possible means of saving the woman's life, and this operation he performed as speedily as possible. There were many difficulties; but except for a pelvic abscess, which for a time complicated the convalescence, the patient did well, and at the present moment was enjoying good health.—2. Dr. MUNRO KERR (Glasgow) read a paper on "The Separation of the Placenta, with special reference to the information derived regarding the Mechanism from cases of Conservative Cæsarean Section." He first pointed out the limitations to the deductions drawn from clinical observations of normal labours and from frozen sections regarding the mechanism of the third stage of labour. Dr. Kerr then gave details of what he had observed with regard to the separation of the placenta in eight cases of Cæsarean section which he had performed this year.

GLASGOW MEDICO-CHIRURGICAL SOCIETY, *November* 15, 1901.—Dr. MIDDLETON and Dr. M'VAIL introduced a discussion on "The Treatment of Pneumonia." Dr. Middleton discussed the etiology and symptoms of pneumonia. He was inclined to regard it as a specific febrile disorder. As regards treatment, he had nothing new to add. The treatment must be that of febrile disorder, namely, the maintenance of the patient's strength. Local applications were useful in the early stages. Stimulants, he thought, were given to too great an extent and in too large doses. To brace up the heart, strychnine was more useful than digitalis; it had to be given hypodermically. For sleeplessness and delirium he gave opium and morphia in the early stages; in the later stages he thought they interfered with the respiration. He had also found useful for these symptoms chloral and bromide, paraldehyde and hyoscine. He was not impressed with the benefits derived from the administration of oxygen. Dr. M'Vail mentioned two cases where the gravity of the illness fell upon the spleen. One came to post-mortem: the spleen was found loaded with pneumococci. He mentioned also the case of a boy who was admitted to hospital with a resolving pneumonia. On the forehead there was an erysipelatous blush, which spread over the face and head. Over the face large bullæ formed, the fluid from which showed abundant pneumococci. As regards treatment, he gave milk, and milk only. Alcohol he gave as a food and not as a stimulant; he gave it liberally. Oxygen he had found very valuable. He thought it should be administered freely. He had given as much as 1000 cubic feet of oxygen in ten days. For sleeplessness he gave opium in all stages, unless there was bronchitis. He did not believe in expectorants, as nearly all the material from the lung was absorbed and very little expectorated. Dr. M'Call Anderson considered the best treatment to be food and careful nursing. For pain and sleeplessness he gave morphia in all stages, unless there was œdema and bronchitis. Delirium he considered to be often the result of high fever, and to be best treated in such cases by antipyretics. For hyperpyrexia and prolonged pyrexia he applied ice-bags to the head and affected side. If this was not successful he gave quinine, and as a last resource he used the cold bath. He thought most cases were the better of a little alcohol, especially in the later stages. For heart-failure he gave liquor strychnina hypodermically, or $\frac{1}{30}$ gr. of digitalis. He had not seen much benefit from the use of oxygen. Dr. Stockman discussed treatment fully. He recommended that the diet should not consist exclusively of milk. He always prescribed m.s. of tr. strophanthi several times daily from the outset. Alcohol he did not give until there were signs of heart-failure, as the effect could be got at once. He did not consider it of much value as a food. Expectorants in pneumonia were more useful for their effect on the heart than on the lungs. Strychnine was not, in his opinion, equal to alcohol as a cardiac stimulant. The only contra-indications to morphia were bronchitis and meningitis. He had not seen much benefit from oxygen.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY, *December* 9, 1901.—The President, Mr. HENRY CLARK, in the chair.—Dr. FINLAYSON gave a demonstration of works on pathological anatomy, principally from the library of the Faculty of Physicians and Surgeons of Glasgow, of which he was for many years the honorary librarian. After a brief sketch of the history of the subject, Dr. Finlayson commenced the demonstration with the first work specially devoted to pathology—the "Sepulchretum" of Bonetus, published in 1679. He then traced the progress of the science by the great work of Morgagni, "De Sedibus et Causis Morborum," the museums of William and John Hunter, Matthew Baillie's "Morbid Anatomy," and the works of other pioneers, up to the great wealth of writings and illustration of the latter half of last century. A most interesting demonstration, which was highly appreciated by the members of the Society.

Glasgow Medico-Chirurgical Society.—*December* 20, 1901.—Dr. **Archibald Young** showed a simple form of gauge for investigation of spinal and other variations of symmetry.—Dr. T. K. **Monro** showed a young woman with enlarged cirrhotic liver, enlarged spleen, and albuminuria. The patient, a female, æt. 22, was admitted to hospital in October 1901, with the history of having been ill for a year with fulness about the waist and swelling of the legs. The liver was enlarged; its surface and lower margin were roughened with nodules. The spleen was two inches below the costal margin; it was tender, smooth, and firm. Heart and lungs were normal. The urine contained much albumin and hyaline and granular casts. Dr. Monro was of opinion that the enlargement of the liver was due to syphilis, and that the enlargement of the spleen and the albuminuria were due to amyloid disease.—Dr. T. K. **Monro** described for himself and Dr. J. A. **Campbell** a case which presented the clinical and post-mortem phenomena of enteric fever, but in which Eberth's bacillus was not found, and in which a general infection by staphylococcus pyogenes aureus existed. The patient, a sailor, æt. 21, had been ill for a fortnight before admission, and had been performing his ordinary duties all this time. He died suddenly five days after admission. Post-mortem the usual lesions were found in the small intestine, and the spleen and mesenteric glands were enlarged.—Dr. **Lindsay Steven** showed blood films from a fatal case of broncho-pneumonia in a child æt. 22 months, showing a marked leucocytosis and changes in the staining reaction of the polymorphonuclear leucocytes. The white blood corpuscles numbered 236,000 per cubic mm., the red blood corpuscles 4,800,000 per cubic mm., and the hæmoglobin was 90 per cent. The polymorphonuclear leucocytes showed eosinophile staining and eosinophile granules.

Forfarshire Medical Association, *December* 5, 1901.—Professor **M'Ewan**, President, in the chair.—Professor **Sutherland** sent a number of specimens for exhibition at the meeting.—Professor **Kynoch** read a paper on six cases of abdominal section for pelvic affections presenting points of interest—(1) Case of repeated ectopic pregnancy in the same patient. (2) Repeated ovariotomy; the first operation complicated with pregnancy at fourth month. (3) Repeated ovariotomy within two years. (4) Repeated ovariotomy; the first operation complicated with pleural effusion. (5) Ovariotomy, illustrating the condition of pseudomyxoma of peritoneum. (6) Ovariotomy, complicated with scarlatiniform rash.—Dr. **Halley** read a paper on the "Surgical Treatment of Sciatica." In it he restricted himself to nerve-stretching. He referred briefly to its first introduction into this country, and said he did not consider it was now done often enough, giving some hospital statistics to support his view. He quoted the views of various authors on the effect and results of nerve-stretching. He considered it was a very effectual form of counter-irritation; pointed out the advisability of traction on proximal and distal ends of the nerve, and of separating the adhesions as far as possible. Bloodless nerve-stretching was considered harmful without an anæsthetic. The notes of one case were given in support of this. Notes of six cases of the open method of stretching the sciatic nerve were given, in all of which the pain had been relieved, and had remained away in one after it had existed for five years, and in another for eight years. In one of the cases, paralysis of extensors of the ankle and peronei had followed, and continued for three months, but then seemed to be passing off. He concluded by expressing the view that nerve-stretching of the sciatic should be done earlier, and if pains did recur, nerve-stretching should then be performed on the branches.

OBITUARY.

Archibald Campbell Clark, M.D., F.F.P.S.G.

After a long and painful illness, during which he was almost entirely set aside from active work, Dr. Clark died on the 28th November last. A man of wide attainments and strong individuality, occupying a prominent place in the profession, he naturally was regarded with esteem by the members of the specialty to which he belonged. To an almost unrivalled knowledge of the management and working details of lunatic asylums he added, what is by no means a commonly associated quality, a literary and clinical knowledge of mental diseases and their treatment. For many years he lectured on insanity in St. Mungo's College, Glasgow; and in 1897 he published a text-book on mental diseases, which, although not meeting with that success which is commutable into common gold, is yet generally admitted to contain, in respect to many subjects,—*e.g.* puerperal mental affections,—contributions equal to any in the English language.

After a distinguished course of study at the University of Edinburgh, where he graduated in 1878, Dr. Clark almost immediately began asylum work by becoming assistant to the late Dr. Grierson at the Roxburgh District Asylum, Melrose. From there he passed to Morningside, where he completed his training under Dr. Clouston. In 1880 he was appointed Medical Superintendent of the Kirklands Asylum, Bothwell. His stay there will always be associated with the training of attendants —in which work he was a pioneer—and with the conjoint compilation of a handbook on the nursing of the insane, which has passed through several editions, and is the recognised manual of the Medico-Psychological Association. In 1894 he was appointed Superintendent of the new District Asylum for Lanarkshire, but for a long time previous to this appointment he was engaged as medical adviser to the architect in the construction of this asylum. Consequently, in its structural adaptation to details of management, the institution stands out conspicuously as the creation of a practical mind capable of clearly expressing its own conceptions.

Sir William MacCormac, Bart., K.C.B., K.C.V.O., M.A., M.Ch., D.Sc., Sergeant-Surgeon to H.M. the King; late President of the Royal College of Surgeons of England.

By the terribly sudden death of Sir William MacCormac the surgical world loses one of its most eminent and respected leaders. Three weeks before his death Sir William was engaged in active practice, though for the past two or three months his condition had given cause for anxiety to his medical advisers. At his own request he was taken to Bath, there to undergo a course of treatment. His first warm bath, given on the day of his arrival, appeared to have had a very beneficial effect, and he was on the point of rising early next morning, to take his second bath, when he fell back on his pillow, dead.

William MacCormac was born in Belfast, January 17, 1836, his father, the late Dr. Henry MacCormac, one of the pioneers of the open-air treatment of phthisis, being a well-known practitioner in that town.

He was educated at the Belfast Institution, and studied medicine at Dublin, and subsequently at Paris, where he was a favourite pupil of Nélaton, and at Berlin. Graduating B.A. (Queen's University) in 1856, he proceeded to the degree of M.A. in 1858, and obtained the diploma of F.R.C.S.I. in 1864. In 1879 his old University conferred upon him the degree of M.Ch. (*honoris causâ*), and three years later that of D.Sc. For six years he held the post of Surgeon to the Royal Belfast Hospital, and rapidly gained a large consulting and operating practice. The Franco-Prussian War in 1870 first brought him prominently before the profession and the public. The French army was terribly deficient in ambulance and hospital outfit, and when MacCormac and twenty-three other British and American surgeons offered their services to the French Government they were gladly accepted. MacCormac, at first second to Marion Sims, was on the departure of that surgeon appointed Chief-Surgeon to the Anglo-American Ambulance Hospital. Into this hospital we believe that some 300 wounded French soldiers were admitted for operative treatment on the day of the battle of Sedan, not to mention a far larger number who received first aid. To MacCormac fell a large share of this work, and he performed many hundreds of operations, and embodied the results of his work in his deeply interesting "Notes and Recollections of an Ambulance Surgeon."

On his return from the war he determined to take up surgical practice in London, and in 1871 was admitted *ad eundem* an F.R.C.S.Eng., and was appointed Assistant-Surgeon to St. Thomas's Hospital, to which institution he became full Surgeon and Lecturer on Surgery in 1873.

For the next twenty years MacCormac's work at St. Thomas's demanded a large share of his time and attention. He was an earnest and successful teacher, and took the greatest interest in his hospital duties, which he never neglected, even though his private practice was at this time a large one. MacCormac had a wonderful faculty of organisation, and this was shown to the full by the success which attended his efforts as General Secretary to the International Medical Congress, held in London in 1881. His knowledge of French and German, and the friendship which he delighted to cultivate with distinguished continental surgeons, rendered him probably the best of Secretaries-General. His services in this capacity were rewarded with the honour of Knighthood.

His work at the College of Surgeons, to which so much time and labour were ungrudgingly devoted, commenced in 1883, when he was elected a Member of the Council. In 1887 he was appointed on the Court of Examiners, of which body he was subsequently Chairman. The Presidency of the College fell to him in 1896, an appointment which he held, by annual re-election, for five successive years—an honour, we believe, unique in the history of the College of Surgeons. Sir William had only a few months prior to his death intimated to his colleagues that he did not desire re-election; otherwise there is little doubt that he would have been re-elected this year. At the distribution of honours at the Jubilee of Queen Victoria in 1897, Sir William was created a Baronet, and shortly afterwards Surgeon to H.R.H. the Prince of Wales, whom he treated for fracture of the patella in 1898.

When the question of sending consulting surgeons to our forces in South Africa was first mentioned, Sir William, though at his age (64) almost too old for the trials, privations, and fatigue inseparable from the battlefield, volunteered his services, impelled thereto alike by his sterling patriotism and his sympathy for the wounded soldier. His work in South Africa, at first in Natal and later in the Orange River Colony, is well known, and won its due reward in the bestowal of the distinction of K.C.B. and his appointment as Sergeant-Surgeon to His Majesty.

Sir William was a man of splendid presence and physique. His iron constitution had, however, been undermined by his tireless energy and by several illnesses.

Sir William married, in 1861, Miss Katherine Charters of Belfast, but leaves no family.

Many were the honours and distinctions showered upon him by foreign countries, including the Commandership of the Legion of Honour of France. And now that this busy, strenuous, useful life is over, crowned as it was with almost every honour to which a member of our profession can aspire, favoured with the esteem, devotion, and admiration of his colleagues, students, friends, and patients, and ennobled by work of high merit, devotion to duty, and patriotism, we may say of Sir William MacCormac that if he is not to be reckoned among the greatest of surgeons of all time, yet he did all things more than average well, he was a pioneer in the introduction of the practice of antiseptic surgery, a sound and judicious surgeon, an authority of weight in the profession, and one of the best Presidents that the Royal College of Surgeons has ever known.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

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METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING NOVEMBER 23, 1901; AND FOR THE YEAR FROM JANUARY 1.

	TEMPERATURE.			RAINFALL IN INCHES.		SUNSHINE. HOURS.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	41°·8	[1] 88° [2] 2320°	78° 738°	2·8	28·3	53	1256	3°·1
Observed	41°·6	[1] 87° [2] 2487°	92° 805°	3·0	25·0	55	1420	3°·42
Difference	−0°·2	[1] − 1° [2] +167°	+14° +67°	+0·2	−3·3	+ 2	+164	+0°·32

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING NOVEMBER, AND SINCE JANUARY 1, 1901. Actual Numbers and Rate per 10,000 per annum.

	TOTAL.		CONSTITUTIONAL DISEASES.		CIRCULATORY SYSTEM.		RESPIRATORY SYSTEM.		NERVOUS SYSTEM.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1899	[1] 1,224 [2] 12,613	206·5 193·4	219 2514	37·1 38·5	105 1184	17·7 18·1	300 2368	50·7 36·3	125 1436	21·0 22·0
Actual Deaths and Rate per 10,000	[1] 1,144 [2] 12,493	192·9 191·6	209 2575	35·2 39·4	99 1226	16·8 18·8	284 2109	47·9 32·2	128 1413	21·6 21·7
Difference from Mean	[1] − 80 [2] − 120	−13·6 −1·8	−10 +61	−1·9 +0·9	− 6 +42	−0·9 +0·7	−16 −250	−2·8 −4·1	+ 3 −23	+0·6 −0·3

	DIGESTIVE SYSTEM.		URINARY SYSTEM.		PNEUMONIA.		PHTHISIS.		CANCER.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1899	[1] 74 [2] 873	12·5 13·4	31 331	5·3 5·1	105 933	17·7 14·3	104 1240	17·5 19·0	54 577	9·1 8·86
Actual Deaths and Rate per 10,000	[1] 71 [2] 942	11·9 14·3	46 378	7·7 5·8	134 996	22·6 15·2	105 1122	17·7 17·2	51 659	8·6 10·1
Difference from Mean	[1] − 3 [2] +69	−0·6 +0·9	+15 +47	+2·4 +0·7	+29 +63	+4·9 +0·9	+1 −118	+0·2 −1·8	− 3 +82	−0·5 +1·24

* NOTE.—The figures [1] denotes the data for November, [2] for year to date.

The four weeks ending on November 23 were slightly colder than usual in the east of Scotland; owing to an increase of cold at night rather than lack of heat by day; the accumulated day-degrees of warmth showing a deficiency of one degree only, those of cold an excess of 14°. The rainfall and hours of sunshine for the period were slightly above the normal. The variability of temperature from day to day yields an increase equal to 10 per cent. of the mean. The mean pressure of wind was also about 10 per cent. over the average for these weeks.

For the year to date there is practically no change in the relative proportions since the end of October.

During November the total number of deaths fell 6·5 per cent. below the average. Deaths from respiratory (−5·3 per cent.), constitutional, circulatory, and digestive diseases were less numerous; from pneumonia (+27·6 per cent.), urinary diseases (+48·3 per cent.), in larger number than expected. The disagreement between the fall in total respiratory fatalities compared with the rise in pneumonic deaths is interesting. If the pneumonia values are subtracted from the respiratory figures for the month, the decrease of respiratory deaths from the remaining causes equals 23·1 per cent. below the average. Similarly, these causes show a deficit equal to 22·4 per cent. for the eleven months of the year, after deducting the values for pneumonia. This alteration in the proportions between total respiratory deaths and deaths from pneumonia has been a constant factor for several years. For example, the deaths from pneumonia during 1891 to 1895 formed only 35·5 per cent. of the total respiratory; from 1891 to 1899, 39·6 per cent.; from 1891 to 1901, 40·07 per cent. In 1900 alone they reached to 46 per cent. of the total respiratory deaths for that year; and, up to November, the present year yields the proportion of 47·2 per cent., representing a rise of 33 per cent. over the value for 1891–95.

The Registrar-General for Scotland's Reports for 1880 and 1898 may be cited in this connection; in 1880 the deaths from pneumonia formed 23·1 per cent. of all the respiratory deaths registered throughout Scotland; in 1898 they constituted 42·5 per cent. of the same, or 81·9 per cent. of increase.

The values for the eleven months of 1901, in addition to those quoted above, exhibit a decrease in total deaths equal to nearly 1 per cent., to which, besides respiratory causes, nervous and phthisical diseases contribute. All the other classes considered are accompanied by increases, especially urinary, cancerous (+14·2 per cent. in both), and digestive diseases (+ 8 per cent.).

To sum up, therefore, the four weeks ending November 23 were characterised by some excess of cold, rainfall and sunshine slightly over the average, and a mean daily variability of temperature considerably above the usual. The eleven months of 1901 have been both warmer and colder than the average of past years, the surplusage in warmth, however, exceeding that in cold; record 11·6 per cent. of deficiency in rainfall; 13 per cent. excess over the normal hours of bright sunshine.

In this dry, sunny, warm, if variable, year, up to the end of November, a large fall in the number of respiratory and phthisical deaths, a considerable rise in those from pneumonia and cancer, along with a decreased total death-rate, have been recorded.

EDINBURGH MEDICAL JOURNAL.

ORIGINAL COMMUNICATIONS.

MEMBRANOUS COLITIS.

By MICHAEL G. FOSTER, M.A., M.D. (Cantab), M.R.C.P.

THE name Membranous Colitis is applied to a condition in which membranes or casts of the bowel are at varying times passed per anum. The name is in some respects an unfortunate one, since the passage of membrane is only the ultimate stage of a condition which presents every gradation from the passage of small quantities of mucus to large masses of intestinal casts. Various other names have been proposed,—mucous enteritis, desquamative enteritis, mucous colitis,—but none possess any superiority over the above. The disease has been recognised from early times, but until lately many cases were confounded with dysentery, while others were regarded merely as pathological curiosities. Mr. Hutchinson showed some specimens of intestinal casts to the Pathological Society in 1857.[1] The disease has also been studied by Sir Andrew Clark, Goodhart, and Hale White in this country; by Potain, Bottentuit, and Dieulafoy in France; and by Edwards and Boyd in America. Until recent years this passage of membranous casts was regarded merely as a rare and unexplained clinical anomaly. During the last decade it has become recognised as a far from rare disease, and one which has a peculiar interest from its constant association with neurasthenia.

The first question which we have to determine is: Are the mild and the severe cases to be placed in one category? Is the case which, after an attack of abdominal pain, passes a few pellets of mucus, of the same nature as the one which, after symptoms of such severity as to simulate intestinal obstruction, passes large intestinal casts, and then experiences a period of temporary relief? The answer to this question must depend on accumulated experience; but in watching a protracted case during a term of years, from its gradual inception, through its periodical attacks of varying severity, to its ultimate cure, one may observe almost every variety of mucous discharge from the bowel. Thus a case which has passed merely mucus will, if watched and followed up, be found sooner or later to pass membranes. My own experience certainly leads me to believe in the unity of the slight and severe cases.

Symptoms.—De Langenhagen states the three cardinal symptoms of membranous colitis to be—the passage of mucus, whether in the form of glairy fluid, shreds, or membranes; irregularity of the bowels; and abdominal pains of greater or less intensity and frequency. This arrangement fairly states the main features of the disease, since these symptoms are present to a greater or less degree in nearly all cases. The distinguishing feature of the disease consists in the character of the stools. First, as regards the foreign element, mucus. This may be present in every variety of form. In the milder cases the scybalous masses are merely coated with a glairy film. In other cases, mucus may be passed separately in globular masses, much resembling frog's spawn. In other cases, again, large globular masses are passed like pieces of jelly-fish. In the more marked cases, however, the mucus is condensed into membranes, which may be passed as annular casts of the intestine, sometimes amounting to as much as a foot in length. These casts are a complete mould of the inner surface of the bowel; the marking of the crypts of Lieberkuhn can be plainly made out. In colour the membranes may vary from glistening white to a dirty green; often they are deeply stained with fæces, having the appearance of dirty ribbed brown paper. More often the membrane is shed not in casts but in loose shreds or strips. Sometimes the mucus is moulded by peristaltic action into a concretion or mould. Thus Eccles records a case in which a tumour was felt in the transverse colon which was regarded as malignant; this suddenly disappeared, and a mass was passed per anum consisting of filaments of mucus kneaded together, and which Eccles describes as being like a mass of boiled vermicelli. I was once called to see a boy who had been dyspeptic and fretful for some days. He was suddenly seized with uncontrollable vomiting and diarrhœa. After about three hours of intense pain, a glistening mass, as large as a pear, of mucous filaments, felted together, was passed, and he forthwith was freed from all his troubles. Microscopically, these membranes consist of cells imbedded in a transparent matrix, containing also phosphates, cholesterin crystals, and bacteria, the *Bacillus coli communis* being in the largest proportion. Chemically, Leathes, at a recent meeting of the Pathological Society, showed that the substance was in all probability not a proteid, nor did it give the sulphuretted hydrogen reaction of keratin. We may regard its exact nature, therefore, as being so far not determined. In addition to mucus, in a few of these cases there is another foreign substance, namely, intestinal sand—the "sable intestinal" of Dieulafoy. This appears as brownish red particles, much resembling uric acid. Sir Dyce

Duckworth, to whom I am indebted for a proof of his paper, and Dr. Garrod, in a communication to the Royal Medico-Chirurgical Society in March 1901, have made a most exact analysis of this material. According to their analysis, this sand contains about 26 per cent. organic material, 61 per of cent. inorganic, and 12 per cent. of water. Investigation of the calcined residue yielded the following result:—

Calcium oxide (CaO)	54·98
Phosphorus pentoxide (P_2O_5)	42·35
Carbon dioxide (CO_2)	2·20
Residue, containing traces of magnesium and iron	0·47
	100·00

Spectroscopic examination showed the presence of urobilin. This uric-acid-like sand must be distinguished from a paler, larger deposit of particles resembling mortar. The latter is due to vegetable débris, coated with phosphates and other salts. This spurious sand can easily be differentiated from the true variety by microscopical examination. After treatment with an acid, the cellular structure will at once become apparent, indicating its vegetable origin. The inorganic residue, after combustion, is also much smaller. Intestinal sand is rarely seen except in cases of mucous colitis, and may fairly be considered as forming one type of the malady. As regards the stools themselves, these may vary from dark or light liquid to scybalous lumps or very thin band-like masses. In some cases large clay-coloured masses are voided, and it is in these cases that the spurious sand of vegetable origin is most frequently observed. In my own experience these clay-coloured masses are rarely passed except during an acute attack in which there is fever, and probably some symptoms of intestinal obstruction.

Turning to the second cardinal symptom, the majority of cases have suffered from constipation. Some will give a history of diarrhœa, but further questioning will generally reveal the fact that the discharge is more of the nature of a flux than a genuine evacuation. When once the disease is established, although there may be complaints of a constant fidgety diarrhœa, yet the dejecta are mainly masses of mucus, and genuine fæcal elements are passed in insufficient quantity. More commonly, obstinate constipation, reaching to the verge of genuine obstruction, is observed. In most cases of membranous colitis, pain is at one time or another a marked symptom. It may vary in intensity from an attack of mild colic preceding the passage of mucus, to pain of such severity as to render the patient completely collapsed, and even to suggest the possibility of perforation. The character of the pain varies in different cases. A considerable number complain of erratic pains all over the abdomen, coupled with undue sensibility to movement. Such patients dread a carriage drive or railway journey. More commonly the pain is most severe about the ascending colon, radiating into the cæcum. In these cases there is generally tenderness over $\mathrm{M^c}$Burney's spot. The principal seat of pain, again, may be the transverse colon when the patient is apt to attribute it to the stomach; acting on which belief, he has probably cut off one article of diet after another in a futile attempt to lessen his discomfort. In other cases the pain is slight, and, according to some authors, entirely absent. Westphalen describes cases of this description in which, however, though pain was absent, there appeared to be considerable digestive discomfort. I have never seen a case in which pain in the region of the colon was not at some time or other complained of.

On physical examination of the abdomen, beyond cutaneous hyperæsthesia, and in some cases enteroptosis, there is not much to be made out. Not infrequently a pulsating aorta will be discovered. De Langenhagen and others speak of being able to make out thickening of the colon, but the bulk of observers do not agree in this. In an acute attack there is often marked meteorism and intense hyperæsthesia. One of the most interesting points in the symptoms of this disease is—how far is it complicated with appendicitis? The appendix forms part of the mucous membrane of the colon, and *a priori* one would suppose that the morbid process would tend to involve the appendix and produce symptoms of appendicitis. Dieulafoy, however, controverts this view, instancing the rarity of appendicitis in typhoid fever and tuberculous ulceration, as well as in dysentery. As he pithily remarks, if the complication were common at spas like Plombières, whose speciality is the treatment of this disease, an operating surgeon ought to be in constant employment. He attributes the supposed coincidence of the two maladies to faulty diagnosis. In eighteen cases which have come under my observation, I have twice seen undoubted appendicitis. In the first case a lady was seized with an attack of appendicitis in 1896, marked by pain in the right iliac fossa, vomiting, and fever; these symptoms being accompanied by meteorism and constipation. After the acute symptoms had subsided, intestinal casts were passed. On this evidence, therefore, the case was sent to Llandrindod Wells, but derived no benefit from the treatment. In 1897 and 1898 three similar attacks occurred. Finally, in 1899, she had an attack of such severity as to render exploration necessary. The appendix was found in the retrocæcal fossa, kinked, moniliform in shape, due to three or four annular strictures, and distended with mucus. In spite of the removal of the appendix, however, four subsequent attacks of pain, coupled with the passage of membranes, have occurred. A very interesting point is that since the removal of the appendix, meteorism, which was a marked symptom in the former attacks, has been entirely absent from later ones. In the second case, a lady was seized with pain in the right iliac fossa, and in the third day of her illness voided by the bowel a large quantity of fetid pus. Within three months she began to pass membranes, and did so for some three years, since which she has to all appearance been completely cured. These cases raise the question as to the possible association of the two diseases, and in any case show the danger of brushing away the question of appendicitis owing to the presence of intestinal casts.

Condition of the Nervous System.—A curious and interesting feature of this disease is the fact that most of its victims suffer from neurasthenia. The types vary markedly: a considerable number of sufferers are dyspeptic, moody, melancholic. These are apt to brood over trifles, while their outlook on life is bitter and pessimistic. Others are cheerful and enthusiastic, bustling and energetic persons, who are always busy. On questioning them, however, one always finds that they sleep badly and have a poor appetite. They have obviously been using up their nervous force at too rapid a rate. Both these types, however, accomplish a great deal of useful work; in fact, it is the exception rather than the rule to find the sufferers from this malady lapsing into a life of idleness.

Temperature.—In some cases there is in each attack slight fever, the temperature during the period that membranes are being passed varying from 99° to 101°. In April 1900 I saw a lady, about forty years of age, of a markedly neurotic temperament. She had complained of pain in the right side when walking, for a day or two. She had a rigor, the temperature subsequently rising to 103°. Urgent vomiting and severe abdominal pain set in; at the end of two days she passed large clay-coloured masses of fæces, with mucus and intestinal casts. Cases presenting this temperature are by no means the rule; ordinarily it is normal or subnormal. De Langenhagen suggests that these febrile cases are to be explained on the hypothesis of stagnation causing some increased virulence on the part of the *Bacillus coli.* The tongue is generally coated, sometimes with thick white fur, but more commonly with a fine yellow layer. It is as a rule moister than the tongue of the ordinary neurasthenic. A clean tongue is but rarely met with. The pulse is changed in character only in relation to the fever or to extreme pain. The tension in the majority of cases is somewhat increased. An extremely slow pulse has been observed by some authors. The urine generally contains phosphates, but otherwise is normal.

Etiology.—Nothnagel has proposed to divide cases of mucous colitis into two groups, according to their supposed etiology. The one he proposes to call "colica mucosa." This is characterised by the passage of amorphous mucus, accompanied by colicky pains, and is regarded by him as an intestinal neurosis, of which hypersecretion of mucus is the sign. The other form is characterised by the passage of membranes without pain, and this he regards as the ultimate expression of intestinal catarrh. Westphalen combats this view, basing his opposition on the careful examination of the stools in eight cases. From these examinations he shows the essential identity of the discharge in all cases. Westphalen's conclusion is that the disease is essentially a secretion neurosis, finding its expression in hypersecretion of mucus, coupled with what he calls spastic constipation, whereby the superabundant mucus is moulded in the colon into membranes. This hypersecretion cannot be due to the mere irritation of scybalæ; it is a rare event amongst thousands of cases of constipation. Coupled with this hypersecretion there is a considerable atony of the large intestine. This want of tone leads on the one hand to stagnation, and on the other to irregular and ineffectual contractions, whereby the mucus, instead of being expelled, is squeezed into membranes. Granted this fact of hypersecretion, we may next examine the question of its relation to the nervous system. Sufferers from this disease are practically all neurasthenics. What relation has this condition to the secretion of mucus? This leads us to the question: Is neurasthenia pre-existent, or is it due to some form of auto-intoxication? A perusal of cases and statistics tend to show that the neurasthenic symptoms were pre-existent. In my own experience, drawn from cases in which I had the patients under observation for one or two years before the development of the disease, I observed neurasthenic symptoms long preceding any passage of either mucus or membrane from the bowel. The most reasonable supposition would appear to be that hypersecretion of mucus may take place under certain at present unknown conditions of the nervous system. And this amorphous secretion may be converted into membranes by the concomitant loss of tone of the bowel. I have, in addition to neurasthenia, seen the disease occur in a patient the subject of universal alopecia. The family history will generally show a marked neurotic taint: I have seen it twice in patients with a family history of insanity. Besides its relation to neurasthenia, gout undoubtedly plays a part in the causation of many cases. Dieulafoy lays great stress on this, notably in its relation to the causation of intestinal sand. In the record of his cases he points out the almost invariable presence of a gouty family history. These histories show for the most part lithæmia, renal calculus, or gravel, rather than true gouty arthritis. Sir Dyce Duckworth's patient had a gouty family history. A patient I have now under my charge complains of myalgia, presumably of gouty origin. I cannot, however, find a case described in which the patient has ever suffered from true gouty arthritis. The patients are for the most part lithæmic, and have that nervous instability so often seen in those derived from a gouty stock. Some patients, however, present no sign of gout, and have no family history of that disease. As regards the origin of intestinal sand, Sir Dyce Duckworth points out that the presence of urobilin, rather than bile salts, in the deposit favours the supposition that it is formed in the intestine, and its formation is probably favoured by a sluggish condition of the colon—a condition which also favours the formation of membrane. I have also, in seven cases, seen the disease develop in the subjects of healed phthisis. In six of these cases arrest had taken place from one to five years. In the seventh case, although tubercle bacilli had long been absent from the sputum, an unhealed bronchiectasis was present.

Sex and Age.—Women form the majority of sufferers; but men are more often the victims than is commonly supposed. Bottentuit in 460 cases saw 250 women, 150 men, 60 children.

Morbid Anatomy.—Autopsies on cases of this disease are far from common. Osler speaks of twice having seen the membrane *in situ;* it separated quite easily from the underlying mucosa, which was quite normal in appearance. Hale White mentions two autopsies. In one the colon was dilated, its walls thin and atrophied, with here and there patches of congestion; in the other case but few membranes were found.

Prognosis.—The course of the disease is long, but in the majority of cases it tends towards an ultimate cure. This cure is, however, a matter of years rather than months. Fatal cases do occur, but they are the exception rather than the rule.

Treatment.—The first aim should be the treatment of the neurasthenia. A fair amount of exercise should be taken, with rest before and after meals. The food should be plain and digestible; vegetables should be given in *purée*, and fruit juice in preference to the whole fruit. Too strict a limitation seldom answers, and I have never seen much improvement on a purely milk diet. Alcohol in any form is, as a rule, best avoided. In the acute attacks attended with fever, rest in bed and a liquid diet are desirable. Morphia may be necessary in these circumstances, but its use must be most jealously guarded. The bowels must be regulated; castor oil in drachm doses is very useful, and may be frequently repeated. In most cases enemata are beneficial. These may be simply soap and water; a less irritating and often more successful method is the injection of four to six ounces of olive oil. Medicated or astringent clysters are generally useless.

Remedies directed to soothing the intestinal pains.—Bael in drachm doses of the confection is sometimes useful; it appears to assuage the colicky pains and lessen the constipation. Bismuth is of very little use. Opium should be given only during an acute attack. Sir Dyce Duckworth recommends aromatic sulphuric acid in 20 ms. to ½ drm. doses. Iron is rarely well borne, and its administration should always be preceded by a blood count, as the pallor of the skin is apt to lead to an erroneous conclusion as to the true condition of the blood. So-called nerve tonics are useful; strychnine should be given with caution; nitrate of silver in doses $\frac{1}{32}$ gr. is sometimes of great service. Many cases derive great benefit from a course of treatment at the Baths of Plombières in the Vosges. The waters are mildly alkaline, containing traces of silica and arsenic, and issuing from the earth at a temperature of 51° C. Their value probably consists more in their method of employment than in their chemical composition. The treatment consists in the administration of warm baths, with a view to calming the nervous erethism, coupled with a course of "douches ascendants." The "douches ascendants" are large enemas of natural mineral water, which are given in the horizontal position. Elaborate and very efficient arrangements are made for regulating the temperature and rate of flow. The quantity injected is from $\frac{3}{4}$ to $1\frac{1}{2}$ litre; and during the operation the patient is turned from side to side, in order, as it were, to irrigate the colon. Another manœuvre employed is the *douche sous marin*. This is a douche of warm water, which is applied to the patient's abdomen while he is in the bath. The water of the bath acts as a buffer, and a form of massage is the result. A healthy person feels definite peristaltic contraction taking place during this treatment. In addition, the patients are treated with a generous and nourishing but carefully prepared dietary. The results are undoubtedly very good, and in chronic cases sensibly hasten the cure. In the more hopeless cases Hale White advocates the performance of a right-sided colotomy, in order to give the bowel rest. His first case unhappily died from an intercurrent cause; but as it was at one time under my care, I can state that the operation conferred the most striking benefit. Where milder remedies have failed, operation should never be too long delayed; even with all its discomforts, it affords a chance of escape from greater misery.

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TWO CASES OF MALIGNANT STRICTURE OF THE UPPER END OF THE ŒSOPHAGUS IN WOMEN.

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The two following cases present certain features which are not devoid of clinical and pathological interest. It will be more convenient to give a brief synopsis of each case in the first instance, and then draw attention to certain salient points.

Case 1.—Miss A., æt. 48, was sent to me on November 4, 1901, by Drs. Lunan and Shaw of Blairgowrie. She complained of increasing difficulty and pain in swallowing, symptoms which had first manifested themselves seven years before. Latterly, there had been a tendency for the voice to be hoarse at times, while speaking had become somewhat of an effort. The patient did not complain of any respiratory difficulty.

It is interesting to note in the family history that her mother, fourteen years ago, died at the age of 62 with cancer of the breast; while one of her brothers, at the age of 23, developed a large swelling in the neck, which the patient believed to be the cause of his death. There was an absence of any family history of phthisis.

With regard to her own illness, Miss A. asserted that she first experienced some difficulty in swallowing seven years ago. She had received no injury, nor had she swallowed any liquid likely to induce any local irritation.

In 1899, three and a half years before this date, she consulted a surgeon, who diagnosed at that time a slight stricture of the œsophagus, and ordered the systematic use of bougies at progressively lengthening intervals. This was carried out for some months with distinctly beneficial results. During the spring of 1901 she again became worse, finding difficulty in swallowing soft-boiled foods, and even liquids, mainly on account of the discomfort which the latter produced. The pain, which was at times somewhat severe, passed up to the ears. As already stated, her voice had latterly become somewhat hoarse and weak. She had also become considerably thinner, losing a good deal of weight. She subsisted of late for the most part on small quantities of milk and soup.

Local appearances.—Examination with the laryngoscope revealed the presence of considerable swelling of the posterior wall of the larynx. The mucous membrane covering both arytenoid cartilages and the ary-epiglottic folds were swollen, of a pinkish red colour, the appearance suggesting a condition of œdema. No ulceration was visible; the swelling was more marked on the right side; and projecting forwards into the cavity of the larynx, just above the right false cord posteriorly, was a somewhat globular swelling, smooth in outline. Both true cords were visible in their anterior parts, and presented a healthy appearance, but the right cord was almost completely fixed. The epiglottis and anterior region of the larynx presented no abnormal condition. Palpation with the finger in the lower part of the pharynx revealed a swelling of considerable extent and hard to the touch. An œsophageal bougie was not passed, this not being deemed necessary. Palpation of the thyroid cartilage externally caused a certain amount of tenderness, which suggested the existence of perichondritis. On both sides of the larynx, and somewhat deeply situated, one or two small glands could be detected. Neither when entering the room nor during the examination did the patient show the slightest indication of any difficulty in breathing.

As she was very anxious that something should be done, Mr. Alexis Thomson kindly saw her in consultation with me, and the question of gastrostomy, of the possible necessity of tracheotomy, and the removal of the disease, was discussed. The patient strongly vetoed any palliative measures, and expressed a desire to have the disease removed. She was admitted to the Deaconess Hospital on November 10, 1901, for the purpose of closer observation and for further investigation of her condition.

The history of symptoms dating from the year 1895 naturally raised some doubt as to whether the local affection really was of a malignant nature. Careful inquiry only substantiated the statement first made, that she had had her attention first drawn to some difficulty in swallowing nearly seven years before. The chest was examined with a negative result, and no tubercle bacilli were found in the secretion which was expectorated. There was nothing in the history, nor was there anything observed externally, to indicate syphilis. A small portion of the infiltration was removed with forceps from the right arytenoid region, but microscopic examination gave a negative result; the epithelium was not thickened, and there was no invasion of the deeper tissue, which was œdematous in character. Potassium iodide was administered for a fortnight, first in 10-gr., and later in 15 and 20-gr. doses, without producing any difficulty in respiration, and without causing any diminution in the size of the swelling; on the contrary, the laryngoscope showed some increase, possibly due to œdema resulting from the administration of the iodide of potassium.

It was noticed in hospital that during sleep the breathing was noisy, but that during the day there was no respiratory distress produced. The patient was able to swallow slowly and with considerable effort bread and butter, fish, and even meat. Liquids were also swallowed with some difficulty. On admission she weighed 6 st. 8 lb., and she lost four pounds during a period of three weeks. As the circulatory and urinary systems were healthy, and as the patient was eager to have an operation performed, it was decided to excise the tumour. The very slow character of the growth and its situation, the healthy condition of the internal organs, and the patient's mental attitude towards operative interference, were factors which weighed in favour of the possible success of a radical procedure, notwithstanding her emaciation and the presence of some enlarged glands. Preliminary tracheotomy was carried out by Mr. Thomson on November 26, the trachea being completely cut across and drawn forwards to the superficial wound. Four days later the same operator removed the larynx, the upper end of the œsophagus, and lower part of the pharynx. This was done through a large T-shaped incision: both the larynx and the œsophagus were cut across below, dissected upwards, and removed in one piece. It was then found that the enlarged cervical glands on each side appeared to be continued into the lobes of the thyroid gland, and it was considered necessary to remove the greater part of that structure along with the lymphatic enlargement. The cut end of the œsophagus was brought well forward to the superficial wound immediately above the tracheal orifice. The pharynx was packed with gauze, and the lips of the skin incision were held together with a safety-pin, no stitches being inserted. Unfortunately the patient collapsed towards the evening of the same day, and, notwithstanding free stimulation, died about one o'clock the following morning.

Examination of the tumour.—The growth involves the posterior and lateral walls of the pharynx immediately above its junction with the œsophagus, and thence extends downwards into the upper end of the latter tube. In its vertical extent the tumour occupies 2 in. of the alimentary canal, of which half an inch is pharyngeal,

the remainder œsophageal. With the exception of a small portion of the left lateral wall of the pharynx, it involves the whole circumference of the tube, the main mass of the growth lying posteriorly and measuring 12 mm. in its thickest part. The mucous membrane covering the left arytenoid cartilage and the left ary-epiglottic fold is infiltrated and œdematous; but this condition is even more marked upon the same structures on the right side of the larynx. The general surface of the tumour towards the lumen of the canal is ulcerated; the constriction is located at the lower end of the mass, the lumen only admitting a director with a calibre of 10 mm., *i.e.* half the normal diameter of the tube in that situation. Microscopic examination shows the growth to be a typical squamous-celled carcinoma, infiltrating both the submucous and muscular coats of the œsophagus. The arrangement of the epithelial cells is well seen in the illustration, p. 115.

Case 2.—Mrs. B., æt. 58, came under the care of Professor Chiene on October 13, 1901, and I wish to acknowledge my indebtedness to him, both for the clinical notes of the case and for permission to make use of them here. The patient was admitted into Ward 14 of the Edinburgh Royal Infirmary, complaining of great difficulty and pain in swallowing. She made the statement that she had first noticed this difficulty four months before her admission. We find that her mother died with cancer of the breast, and one of her sisters of phthisis. The patient herself had become rapidly thinner, and had lost two stones in weight during the last four months previous to her admission.

On admission, extreme emaciation of all the cervical structures was readily noticeable. She weighed 6 st. 7 lb. An œsophageal bougie which was passed down, localised a stricture at a distance of 6 in. from the incisor teeth. Palpation of the neck revealed the presence of a chain of enlarged glands on each side immediately posterior to the sterno-mastoid muscle in the supraclavicular triangle. These were especially marked on the right side. There was no alteration noticed in the character of the voice, nor was any difficulty experienced in respiration.

Notwithstanding the difficulty in swallowing food, the patient began to show some bodily improvement as the result of careful dieting. Gastrostomy was recommended, but she refused operative interference, and was discharged to her home.

During the following two months the patient became rapidly worse, and died on December 20 of inanition. A post-mortem examination was made on the neck by Dr. Harvey Littlejohn, who removed the larynx, trachea, and cervical portion of the œsophagus, and very kindly handed the preparation to me.

A dissection of the parts reveals the following points of interest. The stricture is situated at the upper end of the œsophagus, behind the cricoid cartilage and the two upper rings of the trachea. Its superior margin lies one inch below the commencement of the gullet, and it measures one inch in its vertical extent.

It involves the whole circumference of the tube, the tumour mass being thickest posteriorly, where it measures a quarter of an inch. It is dense and firm in consistence. Anteriorly, it is adherent to the posterior wall of the trachea, but it does not involve the lumen of the windpipe. Posteriorly, it readily dissected off the prevertebral structures on its removal from the body. On the right side, however, the growth has extended beyond the wall of the œsophagus, and forms a small mass of dense, firm tissue lying behind the right common carotid artery. The lumen of the stricture is exceedingly minute, and only admits a fine quill with a diameter of 2 to 3 mm. There is some ulceration of the surface of the growth.

Upon the right side of the œsophagus, immediately below the level of the stricture, is a vertical chain of enlarged glands, three in number. These glands lie in the interval between the gullet and the trachea, and are partially concealed by the right common carotid and subclavian arteries. The upper end of the chain is adherent to the extension of the growth described above. In its lower part the glandular chain passes behind the subclavian artery, extending for an inch below that vessel. Even with the extreme emaciation that was present in this case, palpation of these glands must necessarily have been almost impossible, owing to their concealed position behind the large vessels. The right recurrent laryngeal nerve in its course upwards to the larynx passes through and is involved in the tumour mass lying outside the œsophageal wall. As no laryngoscopic examination was made before death, it is impossible to say what effect this implication of the nerve had produced upon the right vocal cord. The microscope shows the growth to be a squamous-celled carcinoma.

Remarks.—Both the cases just detailed present certain features in common. In each case the patient was a woman above middle life; in both instances the maternal parent died with cancer of the breast; in both the growth was pathologically the same, a squamous-celled carcinoma which occupied the upper end of the œsophagus; in both there was ulceration of the tumour surface and an enlargement of the cervical glands. Butlin in his "Operative Surgery of Malignant Disease," second edition, 1900, describes cancer of the œsophagus as an affection of adult life which very seldom attacks persons under thirty. It is much more frequent in males than in females: at least 90 per cent. of the cases are squamous-celled carcinoma. It may attack any part of the tube, is unusual in the centre, but occurs with almost equal frequency in the upper and lower segments. The glands are affected in a very large number of instances, and ulceration occurs early. It is interesting to make a special note of the fact that both these patients were females, and that there was undoubtedly a family history of malignant disease.

"It is invariably fatal," Butlin goes on to say, "unless the patient is carried off by some intercurrent malady; and the fatal termination is seldom deferred for more than a year or a year and a half, while in many instances, perhaps the majority, death takes place within nine months of the first appearance of symptoms." In 100 cases collected by Morell Mackenzie, the average duration of life after the first symptoms were unmistakably manifested, was eighteen months—the maximum being sixteen months and the minimum being five weeks. Maylard refers to a case reported by Owles, in which the patient lived for three years after the first appearance of symptoms. It is with reference to the duration of the disease that these two cases show a marked contrast to each other. Nothwithstanding the family history of cancer in both patients, the fact that the sex was the same, that the tumours had the same pathological identity and were practically situated in the same part of the œsophagus, yet the two cases differ entirely from each other in regard to the duration of the disease. Not only does the remarkably slow growth of the tumour in the first case contrast so markedly with the rapid development in case No. 2, but the former stands out in prominent distinction to what is usually met with in malignant disease of the œsophagus. In many cases of primary *intrinsic* epithelioma of the larynx the history of the affection is found to extend over several years, but we do not find that a similar state of things exists in the case of the gullet. Special care was taken in this case to make certain of the duration of the symptoms, as their long continuance was a factor which in our minds militated against the certainty of the diagnosis of malignant disease. Even allowing for a possible error on the part of the patient, however, we have distinct proof of the existence of a stricture, diagnosed by the passage of a bougie three and a half years before the final operation. This case, therefore, is one of special interest, and merits more than a passing notice on account of the somewhat exceptional duration of the disease. In the second case, on the other hand, the course of the disease was one of great rapidity, as a fatal termination supervened six months after the onset of symptoms. The difference in the age of the two patients can hardly be regarded as influencing the course of the tumour growth; indeed, one would have expected a more rapidly fatal issue in the younger patient, in whom the disease must have commenced at the age of 40 or 41 years.

In conclusion, I should like to draw attention to the simple character of the portion of tissue removed in the first case by the forceps. The swelling visible on laryngoscopic examination in reality consisted mainly of healthy mucous membrane in an œdematous condition, and a piece of this was removed from the arytenoid region and not from the tumour mass itself. In removing portions of tissue from the larynx for diagnostic purposes, considerable caution must be exercised in forming conclusions with regard to the appearances noted through the microscope the same remark, of course, applies to a case of malignant disease of the œsophagus secondarily involving the larynx. If the clinical symptoms and signs are in favour of cancer, and histological examination gives a negative result, the clinical aspect of the case must be considered of greater value than the microscopic examination. On the other hand, provided that the microscopist is a man of experience, a histological examination demonstrating cancerous tissue should outweigh all negative clinical evidence. It is possible for the portion removed to appear of a simple nature when the growth is in reality malignant: the piece may not be of sufficient size, it may not include the whole thickness of the growth, or, as in this case, it may be removed from an apparently infiltrated area which in reality is only œdematous.

DIABETES AND PREGNANCY.

By G. Ernest Herman, M.B. (Lond.), F.R.C.P., *Senior Obstetric Physician to the London Hospital, etc. etc.*

I first have to relate a case of this rare complication—

Case.—The patient was a Jewess, æt. 30. She said that she had always had good health until the summer of 1900, when she had diphtheria; and she thought she had never been really well since. She had been married twelve years, and had had seven children. She said her labours were difficult, the last three children having been born dead; but she had made good recoveries, though the later recoveries were not so good as the earlier ones.

She last menstruated in the middle of August. At that time she believed herself well. When about three months gone she noticed that she was getting weak, and was hardly able to walk. About this time she began to have a very irritating discharge from the vagina, which caused "terrible itching," so that she had to use a douche twice a day or oftener. She also suffered from "boils" on the private parts, and burning pain in passing water. For the last three months she had been very thirsty: she had suffered from thirst in her former pregnancies, but not to the same extent as in this one. She had been losing flesh rapidly during the last month. Had had a slight cough for the last six months.

Three months ago her doctor told her that she had diabetes, and prescribed for her a special diet; but with the exception that she used saccharin in place of sugar, she followed not his advice.

On March 23 she awoke in the night suffering from "bearing-down pains," and vomited. During the subsequent days frequent pain and vomiting continued. On March 26, Dr. Herman saw her in consultation with Dr. Hearne of Kingsland Road, and on the same day she was removed to the London Hospital.

When admitted she seemed moribund. She was emaciated: face pinched; extremities cold; pupils small (she had been given morphia hypodermically before admission). She was only half conscious, answering questions with difficulty. Pulse 130, soft, regular. Respirations 28; noisy, with expiratory groan. Urine 1016, pale, acid, containing albumin and sugar. Temperature 97°.

The pregnant uterus reached to the ribs and the ensiform cartilage. Fluctuation could be felt over it in all directions. The fœtus was too movable for its parts to be distinctly felt. Greatest girth of abdomen 38½ in. Distance from pubes to top of uterus, measured over its convexity, 15½ in. Fœtal heart not heard. No fœtal movements felt. Cervical canal not shortened, but open enough to admit the finger. Breasts not large.

The patient was admitted about 9.30 P.M. At 10 P.M. she was given an enema of coffee 4 oz., brandy 2 oz., which was retained. After this she became rather warmer.

March 27, at 2.30 A.M., she was given an enema of an egg and 4 oz. of peptonised milk. At 3 A.M. the pulse had quickened up to 140, and was smaller; the patient colder and weaker. She was given ⅛ gr. of strychnia hypodermically. At 4 A.M. the membranes were ruptured artificially, and much liquor amnii let out. Another hypodermic injection of $\frac{1}{60}$ gr. of strychnia was given, and 2½ pints of saline solution was injected into the cellular tissue under the left breast. This fluid was quickly absorbed, and marked improvement followed: the pulse became fuller, the face less pinched, and the patient became warmer. An enema of brandy 2 oz. and water 18 oz. was given, and was nearly all retained. At 8.50 A.M. the patient was naturally delivered of a dead and decomposing female child. It weighed 5¾ lb., and was judged to have been dead two or three days. Neither finger nor toe nails reached to the ends of the digits. The liquor amnii, which was excessive in amount, contained two-fifths albumin, a trace of sugar, and a trace of urea. At 10.30 A.M. the patient was looking distinctly better. Pulse 132, fuller. Breathing still noisy, 36 per minute. No vomiting since 8 A.M. Taking plenty of fluid nutriment. At 8.45 P.M. pulse was 128, and much fuller. Great thirst; lips and tongue dry. Pharynx congested.

March 28.—Patient was last night given 20 grs. of trional, after which she slept for three hours. To-day is very much better. The pinched aspect of face is gone; her cheeks are of a good colour. Pulse 112, regular; respirations no longer noisy. Her chest was examined, and nothing abnormal found, except a few crepitations at the right base. Tongue less dry. Much soreness of mouth and throat, and congestion of the pharynx. Patient is inhaling steam every four hours, and having the throat swabbed with an alkaline lotion. She is taking lozenges containing potassium chlorate, gelatin, glycerin, and saccharin, and using a 2 per cent. cocain throat spray; but the irritation of her throat makes her restless and keeps her awake.

March 29.—General condition much better. Pulse 100, respiration easy and quiet. Mucus is coughed up more easily. Fundi oculorum normal.

March 30.—Temperature 101°, pulse 112, respirations 24. Over base of right lung there is dulness, feeble breath sounds, and diminished, but not absent, tactile vocal fremitus and vocal resonance. Patient complains of pain in this part when she takes a deep breath. The uterus was washed out with a weak solution of iodine.

March 31.—Patient had a rigor last night; her temperature went up to 105°, and she was delirious. This morning is much better. Temperature 99°·2. No diacetic acid in urine.

April 2.—There are physical signs of pleurisy at right base. Temperature 102°·5.

April 3.—Temperature 102°. To-day a copious and offensive vaginal discharge.

April 4.—At 6 P.M. the patient had another rigor, and her temperature rose to 105°·8. At 10 P.M. an intra-uterine douche was given.

April 5.—Temperature had fallen to 99°·5.

April 6.—Temperature normal. After this day the temperature gradually rose, till on *April* 10 and 11 it was over 101°. Then it gradually fell to normal. The pulse became quicker and weaker. On *April* 15 she began to vomit; and on *April* 16 she died.

Urine.—In quantity, on most days more than 70 oz. were measured. Her bowels were generally open several times daily, and the urine passed with the stools escaped measurement. Its specific gravity ranged from 1028 to 1032. The amount of sugar passed was, up to April 5, from 50 to 75 grms. daily, measured, without estimating what was lost with the stools. After this date the amount of sugar increased, till, on the day before death, it reached 118 oz. A trace of albumin was present up to April 3; none after this date.

A *post-mortem examination* was made by Dr. Hadley. The right pleura contained about 2½ oz. of pus. At base of both lungs there were recent adhesions. No abnormal fluid in left pleura. Right lung, upper part engorged and œdematous. At lower part, near the pus in pleura, there were masses of soft material, some of which were breaking down. These, on microscopical examination, proved to be round-celled sarcomata. The left lung was for the most part in a similar engorged condition; but at its base were two small gangrenous cavities without any new growth. Bronchial glands unaffected. No gross changes in brain. Uterus measured 3¾ in. in length. No new growth in it. Pancreas unfortunately not examined.

Matthews Duncan[1] was the first to study the effects upon one another of pregnancy and diabetes. The most recent and complete monograph upon the subject is that of Kleinwächter.[2]

Infrequency of diabetes with pregnancy.—Diabetes is commonest in the years between 40 and 60. Figures collected by Kleinwächter show that two-thirds of the cases of diabetes in women do not begin till after the menopause. When the disease occurs in a woman of child-bearing age, it usually, when advanced, suppresses menstruation, and sometimes produces atrophy of the uterus. There are, however, a small minority of patients in whom menstruation is regular and its quantity not diminished. Such may become pregnant, and even repeatedly pregnant, during the course of the disease.

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[1] *Trans. Obst. Soc.*, London, 1882, vol. xxiv.

[2] *Ztschr. f. Geburtsh. u. Gynaek.*, Stuttgart, 1898, Bd. xxxviii.

Its gravity.—Diabetes, though not common in the young, is more dangerous in young subjects than in old; hence diabetes with pregnancy is usually a severe form of the disease.

Effect of pregnancy on diabetes.—Pregnancy with diabetes is so uncommon that our knowledge of its clinical history is based on but few cases. A diabetic woman may become pregnant, or a pregnant woman may become diabetic. Diabetes coming on during pregnancy may get well within a few days or weeks after delivery, and recur again in subsequent pregnancies, though not necessarily in every pregnancy. Such cases indicate that the pregnant condition favours the production of the disease. The few cases that have been reported go to show that in these intermittent cases coming on during pregnancy, the prognosis is better than in cases in which diabetic women have become pregnant. Some of these intermittent cases have recovered when child-bearing has ceased; in others the disease has got worse with each succeeding pregnancy. When a diabetic woman has become pregnant, the symptoms of the disease have usually become aggravated and its progress hastened.

Effects of diabetes upon pregnancy and childbed.—Premature delivery, due to intra-uterine death of the child, has occurred in about two-thirds of the published cases of pregnancy with diabetes. Hydramnios has been observed in an unusual proportion of cases; but not enough cases have been published to enable us to say that this is the rule. The children have often been large. In two cases the liquor amnii was found to contain about 3 per cent. of sugar, and in one the fœtal urine contained sugar. When a diabetic patient has been delivered, the lying-in may go on normally, whether the diabetes improves or not. But some patients have died from collapse and coma, with quick pulse, subnormal temperature, cold extremities, and unconsciousness, within a few hours or days of delivery. Death in a similar way has been observed in diabetic subjects after surgical operations or accidents.

Treatment.—The obstetrical management of pregnancy complicated with diabetes alone calls for consideration here; for the fact of pregnancy is no contra-indication to diatetic and medicinal treatment such as is found beneficial to diabetics who are not pregnant.

The main obstetrical question is, Should pregnancy be interrupted or allowed to go on? At present experience gives no answer to this question. We must therefore act upon probability. I think that there are strong reasons for expecting that the early termination of pregnancy will prove the best treatment for a pregnant diabetic. What may happen if the pregnancy goes on?—(1) The chances are two to one that the child will die *in utero*. Its life is therefore not of much account. (2) It is possible that when the pregnancy is over the diabetes may get well. *A priori*, this is more likely to take place the earlier the pregnancy ends; because the shorter the time the disease has lasted the less advanced will probably be those unknown pathological changes upon which diabetes depends. (3) The patient may die from collapse and coma soon after delivery. This is more likely to happen the further the pregnancy has gone; for then the disease having lasted longer the patient will be more weakened by it, and the pathological change on which it depends will be more advanced. One of these three events has occurred in most of the published cases: those in which pregnancy and labour were gone through without influencing the diabetes or being influenced by it, are a minority. If there be hydramnios, I think no one will question that premature labour should be at once induced. But I think, for the foregoing reasons, that in any case of diabetes with pregnancy, the early termination of pregnancy is the course which offers the greatest probability of benefit to the mother. Kleinwächter advises against this course, on the ground that we have no evidence of its benefit. But it has only been done once, and then in a case in which the mother was moribund. Where the light of experience is wanting, we must act upon probability.

For the report of the case, I have to thank Mr. P. A. Green, clinical clerk; Dr. F. P. T. Hilliard, resident accoucheur; and Dr. H. R. Andrews, obstetrical registrar.

A PHASE IN THE HISTORY OF CHOLERA IN INDIA.

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MY first lessons on cholera were received at the hands of the late Sir George Johnson, at the time Professor of Medicine at King's College, London. The originality and lucidity of his theory of collapse, and the rationale of the treatment advocated by him, as well as the striking examples of the propagation of the disease by water narrated, had left an indelible impression on my mind. Judge then of the astonishment with which I listened when at Netley to the eloquent lecture on cholera by the late Professor Maclean, C.B., a lecture in which we were told of the views of the disease we should meet with in India. Professor Maclean rightly controverted this disastrous theory, and warned his hearers never to believe in them. This view certainly does not adorn a tale; nevertheless, I venture to tell the tale.

India is pre-eminently the land of sacred pilgrimages. Let me narrate in particular the history of one of them. Every year to Hurdwar, the head of the great Ganges Canal, a pilgrimage takes place; but as every twelfth year is a specially sacred year, an especially large body of pilgrims wends its way thither. The ritual is the following:—On the chief day of the pilgrimage, each individual by his religion is impelled to bathe in the canal, and a space divided off is set apart for the purpose; he not only has to bathe in it, but has to drink some of the sacred water before he leaves it; whilst, thirdly, some of the water is in numerous instances taken away in bottles to their homes by the pilgrims.

In the year 1867 such a twelfth-year festival took place. Just before the conclusion of the gathering, cholera broke out amongst them, and with the dispersal of the pilgrims a vast epidemic spread over India. The Sanitary Commissioner with the Government of India in 1867, in his subsequent report on the outbreak, thus writes:—"*First*, In considering the cause of the epidemic, he decides it was not due to filth and bad sanitation, for the camp was kept far better than, and in marked contrast to, all preceding fairs. *Secondly*, It was not due to atmospheric phenomena. For there was nothing to show that there was any variation in temperature, or air pressure, or rainfall different to those of preceding years. *Thirdly*, Was it due to importation? There was cholera in the Terai in 1867." The superintendent of the district writes: "The pilgrims took it to Hurdwar, and from Hurdwar they brought it back, and spread it on all sides. Numerous deaths occurred amongst the pilgrims proceeding to Hurdwar prior to the outbreak." In the Bhurtpore district, again, cholera was present on 6th April. The Maharajah of Bhurtpore visited Hurdwar with a large retinue just at the time when the disease began to be disseminated. The Sanitary Commissioner thus concludes in par. 40 that neither filth nor atmospheric causes were to blame. Hence, "if not general at the fair, it must have been brought there. This idea is quite consistent with facts; it is quite consistent with the etiology of other diseases, such as small-pox, regarding the propagation of which we have more precise information. Even had it been impossible to discover the probable source of the importation, the arguments would not have become invalid; but there is the direct testimony of the superintendent of the Terai, that pilgrims going to Hurdwar from his district had the disease among them and died on the way. It is sufficient to state that the disease as it broke out at Hurdwar appears to have been introduced by pilgrims from some infected district." Now the night before the great bathing day (April 12) a heavy storm flooded the camp; the sewage arrangement favoured the washing of the sewage itself into the Ganges. On the day succeeding the storm, the pilgrims bathed in the river, each pilgrim drinking of the water. The bathing-place was a space 650 ft. long by 30 ft. wide, shut off from the rest of the canal by rails. Into this narrow enclosure pilgrims from all parts of the encampment crowded, bathed, and drank of the water. The water was thus drunk foul and contaminated by whatever was washed from the bodies or clothes of the pilgrims. Cholera broke out in an epidemic form on the day after. I now quote again the remarks of the Sanitary Commissioner :—

"PAR. 300. *The effects of the dispersion of the pilgrims in spreading cholera.*—On this question, the facts have been narrated with great care; every statement of any importance has been given, for the evidence has been considered not with the object of supporting any preconceived theory on the mode of propagation of the disease, but with the sole view of endeavouring to ascertain the truth. Did the pilgrims as they returned to their homes carry cholera with them, and thereby occasion the outbreak which subsequently followed in the various districts through which they traversed or to which they belonged ?

"PAR. 301. On the first part of the question there can be no difference of opinion. That cholera went with the pilgrims from Hurdwar, and accompanied them to a greater or less distance in every direction, is a fact which admits of no dispute. Suffice it to say, that the pilgrims bore the disease with them to a distance varying from 50 to 300 miles in almost every point of the compass.

"PAR. 302. This fact in itself may be regarded as evidence of communicability of the disease. That the pilgrims imbibed the poison at Hurdwar in large quantities cannot be doubted, but it is not probable that the disease should remain latent so very long as to appear among some of them only when they had reached places so far distant as the Upper Provinces of the Punjab. Judging from all that is known of the disease, it appears much more probable that these and others who were seized weeks after they had left Hurdwar, were infected by pilgrims in whose company they had travelled, than that the germs of the disease had remained all that time undeveloped within their system.

"PARS. 303, 304. The results of the details regarding the advent of the cholera-stricken pilgrims, and the subsequent appearance of the disease amongst the general population of the districts who had been previously free from it altogether, may be thus summarised: Excepting Goorgaon, in which the history of the first case is doubtful, no cholera appeared in any of these fifty-one stations or districts until ample time had elapsed for the pilgrims to reappear, or for others to enter from infected places. There was no simultaneous outbreak of the disease over a large area; but the general evidence is not merely negative, for, excepting Goorgaon, there was no cholera in any of the fifty-one places named until the pilgrims actually had returned, and even in Goorgaon the epidemic prevalence dates from their return.

"PAR. 305. But even more remarkable is the evidence that in most cases the first cases in the district were pilgrims who had been to Hurdwar. In thirty-five out of the fifty-one districts the first persons attacked were pilgrims, and after they had been seized the disease appeared and spread amongst the residents.

"PAR. 306. In addition to the facts are the decided opinions of the numerous medical officers and civil officers by whom the facts were observed. Thirty-two medical officers, many of them men of great experience, who were indefatigable in carrying out the arrangements for the care of the devotees, and most careful in ascertaining the facts connected with the appearance of the disease within the limits of their own charges, are decidedly of opinion that the cholera was imported by pilgrims. . . . In no case has any positive evidence been advanced to show that such a cause was improbable, much less that it was impossible.

"PAR. 307. There are only two ways in which these facts can be satisfactorily disposed of. Either they must be set aside as untrustworthy, or they must be accepted as making out a very strong case in favour of the opinion that cholera is spread by human intercourse. It is quite impossible that the whole story of the returning pilgrims carrying cholera with them from Hurdwar to Rawal Pindee, with the dates of its appearance in the successive districts through which they passed, can have been invented. The facts cannot be set aside. It cannot be regarded as a mere coincidence that in thirty-five districts of Upper India, covering an area larger than that of Great Britain, the epidemic should have gradually appeared in one place after another immediately after the return of a body of pilgrims stricken with the disease.

"PAR. 308. If not by the pilgrims, how was the disease spread? It could not have been carried by the wind in all directions at one and the same time, nor is it probable that the force of the wind should have exactly kept pace with the pilgrims. There are, no doubt, difficulties to be explained under any theory which attempts to account for the fact.

"PAR. 309. *Analogy of other diseases.*—But it is to be remarked that similar difficulties exist in regard to the spread of diseases, the communicative nature of which is undisputed. Can it be explained why smallpox prevails in some years and not in others? It is a singular fact that all epidemic diseases of which we have any accurate knowledge are communicable, and however fitful and inexplicable the cases may be, it may be fairly assumed that every new case is usually, if not always, the progeny of a parent of like kind, although the parentage often, and indeed generally, cannot be traced. The seed of a plant affords a not inapt analogy to what appears to be the most rational view of the germ of epidemic disease. In order to germinate and bear fruit, it must fall and be received into a suitable soil. It must be planted at the proper season, and enjoy the advantages of climate and circumstances which are best adapted to its growth. Similar conditions appear to be necessary for the propagation of an epidemic.

With little doubt the germ of epidemic cholera appears to reside in the evacuation of a person suffering from the disease.

"PAR. 311. But whatever theoretical difference of opinion may exist as to the propagation of cholera, the fact of the great epidemic of 1867, and its spread over Northern India, teach no doubtful lesson, and it is this—that human intercourse plays a very great part in the diffusion of the disease, and that returning pilgrims in particular are very dangerous arrivals."

This was the lucid summary of events given by the Sanitary Commissioner with the Government of India for 1867. The chief points to which he drew attention were the following:—

(1) The disease spread to every point of the compass. (2) The outbreak was not a simultaneous outbreak over a large area (3) No cholera appeared in any place until the arrival thereat of infected pilgrims. (4) This fact could not be regarded as a mere coincidence. (5) In most places the first cases were among pilgrims, subsequently among the residents of the places attacked. (6) Out of fifty-one districts attacked, the medical officers were of opinion that it was due to importation in thirty-two cases, but that in none of the other cases was such a mode of origin improbable, much less impossible. (7) The conclusion arrived at, namely, that the return of the pilgrims is very dangerous, inasmuch as they play a very great part in the diffusion of the disease, and that the poison lies in their evacuations; that it is not due to bad sanitation or to atmospheric causes.

Such, then, is the history—so admirably portrayed by the Sanitary Commissioner with the Government of India for 1867—of one of the most striking examples of the propagation of cholera by human intercourse. As Professor Parkes truly declared, it was an example on a gigantic scale of cholera water poisoning.

Time went on, and with it a change of opinion occurred in the office of the Sanitary Commissioner with the Government of India. For in 1878 we find the officer who then held the appointment, in the orders of the Berar Sanitary Report, stating: "The chapter on cholera is too much occupied with the statements and opinions of civil surgeons on the importation doctrine. Little or no practical good can be expected from such inquiries, and it is therefore of great importance that the time of the medical and other officers should not be spent on them. If it were demonstrated that cholera is spread by human intercourse, nothing could be done to prevent such intercourse." This was written, as stated above, in 1878.

In 1879 the great twelve-years' festival again came round. Again the vast assemblage of pilgrims took place at Hurdwar; again was cholera affecting them at Hurdwar; and again after the great day of the festival did "cholera burst out like a long-pent-up fire," and was carried away by the departing pilgrims to our North-Western Frontier, and thence to Afghanistan. But now unfortunately, our troops were at war with Afghanistan. Camp by camp the disease invaded the three lines of advance.

In the Peshawur Column—

38 cases occurred in May.
284 „ „ June.
32 „ „ July.
4 „ „ October.

In the Kurram Valley Column—

9 cases occurred in July.
12 „ „ August.
1 case „ September.
12 cases „ October.

In the Candahar Column—

1 case occurred in June.
52 cases „ July.
41 „ „ August.

Now, in reviewing these figures, one fact stands out preeminently, namely, that in the Khyber line there was nearly an eightfold increase of cases in June over those of the preceding month. In neither of the other two columns is there this remarkable increase of cases in any one month over another. Is there any reason for this? There is. Let me quote from Surgeon-Major Pringle—

"From this intensely cholerised centre (Hurdwar), the outcome of the gathering of literally hundreds of thousands of pilgrims, with cholera proved to be in their midst, resulted what was known among the troops returning from the last Afghan war as 'the march of death.' Another proof of the penalty demanded for the violation of all sanitary laws and sanitation." The peace of Gundamack had been signed, and Government wished to withdraw troops from the Khyber line. But cholera was advancing up the pass. Most of the troops at this time were encamped on spurs above the plain, and were in good health. By remaining, it was held that they would become exposed to the "atmospheric wave," whereas by returning they would march away from it. By remaining, it was held they would be attacked in greater numbers. The withdrawal, therefore, took place in June, and the march of death resulted. "The choice was a choice of evils; and great as the loss was, there seemed every reason to believe that it would have been equally great, perhaps greater, had the troops remained where they were." But I venture to submit that the statistics of the disease in the other columns are not favourable to this opinion advanced by the Sanitary Commissioner with the Government of India. In the Kurram Valley no month stands out preponderating in cholera mortality, there being only nine cases in the British troops in the first month, and twelve cases in the second. In the Candahar column, counting the cases at the end of June with those of July, there was a decrease of twelve cases in the second month. In the Kurram Valley, the troops moved out on to the surrounding spurs in most instances, and the result showed that, granting they were penetrated by an "atmospheric wave," the mortality was practically unaltered—nay, even in some regiments which lay more in the course of this wave in the plain, there was no increase of mortality at all.

We thus see that the views of the Sanitary Commissioner with the Government of India for 1878 and 1879 were diametrically opposed to those of the Sanitary Commissioner with the Government of India for 1867. By one, infection by human intercourse was held to be the cause of the epidemic; by the other, an atmospheric wave "was the *fons et origo mali.*" Let us now, therefore, examine the arguments of the latter official; and such examination cannot be better carried out than in the spirit advocated by the Sanitary Commissioner for 1879. In par. 19 of his Sanitary Report, this official thus writes in 1879: "The problem to be solved requires patient investigation, and a calm judgment which shall not be swayed by any preconceived ideas or deterred by fear of adverse criticism. The cholera controversy has unfortunately excited much animosity and bitterness between those who differ in opinion. The doctrine of human intercourse is for the time the popular doctrine both with the medical profession and with the public, and neither facts nor arguments which are at variance with this view find much favour. All this is to be deeply regretted. If this doctrine is true, it can afford to stand the fullest criticism and the most thorough investigation." Animated by these inspiring sentiments, I propose to give in the following lines the fullest criticism and the most thorough investigation into the arguments and facts of the "climate and other cause theory."

The arguments for the "climate and other cause theory" may be thus enumerated:—

(1) The one-sided anecdote argument. (2) The X Y Z argument. (3) The railway and steamboat argument. (4) The hospital assistant argument. (5) The coincidence or stage-coach argument. (6) The logical method of reasoning argument. (7) The direction of the epidemic argument. (8) The hill station argument. (9) The *ipse dixit* argument. (10) The experience of India argument. (11) The non-spread by water argument.

1. THE ONE-SIDED ANECDOTE ARGUMENT.—We have seen that in par. 19 of his Sanitary Report for 1879, the Sanitary Commissioner with the Government of India notes that the doctrine to which he is opposed can, if it be true, afford to stand the fullest criticism and the most thorough investigation. The following is

an example of this fullest criticism. The careful investigations of authorities who uphold the theory of human intercourse are characterised as "one-sided anecdotes," and all facts adverse to the view are held to have been suppressed. Considering that the greatest investigators of our time are here implicated, such men, including that truly great man Parkes, Cornish, Burnell, De Renzy, Macnamara, Kenneth M'Leod, George Johnson, Simon, Nelten Radcliffe, Liebermeister, Koch, and a host of names of cosmopolitan celebrity, the accusation of "one-sided anecdotes" and of "suppression of facts" bears with itself its own refutation. Again, was the Report of the Sanitary Commissioner with the Government of India for 1867 issued on a basis of "one-sided anecdotes"? It is indeed somewhat surprising that the large number of medical officers of 1867, who were then stated by the Sanitary Commissioner with the Government of India to have been "men of great experience, and most careful in ascertaining the facts connected with the appearance of the disease within the limits of their own charges," should have been succeeded by men apparently endowed with precisely opposite mental characteristics.

2. THE X Y Z ARGUMENT.—"A hundred people are asked what is the cause of epidemic disease? Ninety-nine would probably reply that epidemics are due to contagion; that a sick person coming from some place or other brought with him the germs of disease, and that these germs found a fitting place for their development in the persons of other people." But now the hundredth individual, in the person of the Sanitary Commissioner with the Government of India for 1879, steps in, and says this is no explanation at all; for supposing a person Z is suffering from an epidemic: then there is little satisfaction in being told that it was imported from Y, and that the epidemic in Y was imported from X, for in time we shall get to A, and then where can A have got it from? Of this train of reasoning we can only say with gratitude that it would banish the whole body of infectious and contagious diseases from our midst. A poor relation to this argument is also to be found in the following:—The case is cited of a person suffering from a disease, or coming from a place where such a disease is prevalent, and then becoming attacked by it. Shortly after his arrival in his new locality, one of those in his own house, or of those living in the neighbourhood, is attacked also. It is then usually judged—or at any rate suspected—that the first person has been the cause of the disease in others. Now this conclusion is at once totally rejected by the Sanitary Commissioner with the Government of India for 1879. Why? Because "*there are others who have not suffered*" *!!!* Following this line of argument, it will at once be seen how beneficial to mankind at large must be this elementary principle of Indian sanitation, for no infectious or contagious disease could possibly exist if this line of reasoning be true.

3. THE RAILWAY AND STEAMBOAT ARGUMENT.—The Sanitary Commissioner with the Government of India for 1879 held that human intercourse has nothing to do with the diffusion of cholera, because railways have not facilitated the progression of the disease. Let me subject this statement to the "fullest criticism."

A. *Railways.*—(*a*) The Cholera Report of Dr. Rice on the outbreak of cholera in the Allahabad district in 1882 shows facts utterly opposed to this dictum.

(*b*) Deputy-Surgeon General A. C. De Renzy, C.B., the Sanitary Commissioner for the Punjab, showed how the frequency of cholera in the North-West Provinces increased since the introduction of railways. The dates of the epidemics show unmistakably how the latter increased in frequency after the introduction of railways. Thus the dates are as follows: 1805, 1813, 1827, 1845, 1856, 1861, 1862, 1865, 1867, 1869, 1872, 1875, 1876, 1879, 1881.

(*c*) The example narrated in support of this part of his argument by the Sanitary Commissioner himself apparently confirms his dictum, but "the most thorough investigation" does not do so. Thus—

Station.	Years.	Strength.	Admissions for Cholera.						
			Jan. to June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Meair Mir	1856	1576	...	...	435	65	1	...	...
	1861	1700	...	...	601	64	...	..	...
	1869	974	...	...	...	...	...	...	...
	1872	1358	...	1	179	5	...	...	...

The Sanitary Commissioner thus comments: "A glance at these cases will show that in 1869, 1872, they occur no earlier than they did before in 1856–1861. At Meair Mir it is worthy of note that in the epidemic of 1861 the first case among the Europeans was on August 2. In 1872 it was on July 31, a difference of two days." But in his comments on the above statement, Surgeon-General De Renzy, the Sanitary Commissioner of the Punjab, draws attention to the remarkable fact that the details of the epidemic of 1867, *which began in May* and attained its maximum in July, and in which there were eighty-six cases with fifty-two deaths, is *omitted from consideration*, "although the influence of railway communication in diffusing it was most marked." Again, the same officer showed how no mention is made of the fact that in 1872 cholera appeared in May, and was most virulent in June in the Lunatic Asylum at Lahore, about five miles distant only from Meair Mir.

(*d*) Dr. Barry, in his Cholera Report for 1896, showed how increased facilities for steam communication by land and water have conduced to a rapidity in the diffusion of cholera hitherto unprecedented.

(*e*) In 1892 cholera appeared in Afghanistan. It became epidemic, and, marching slowly through Persia, it was at Teheran in 1892; once it touched Russian territory it spread along the railway with startling rapidity. At Askabad the epidemic came into contact with the Trans-Caspian Railway, spread eastward and westward along it, reached Baku, and thence found its way along the Trans-Caucasian Railway to Tiflis. Within a month of the recognition of the disease at a town on the Trans-Caspian Railway, it had penetrated into the heart of European Russia, having taken in its transit from Central Asia *as many days as, before the creation of railways, it took months.* In its advance it clung in a remarkable way to the main lines of traffic, *i.e.* along the railways and the Volga.

(*f*) In 1882, after the pilgrimage to Tirupati, Surgeon-General Burnell showed how cholera followed the dispersion of the pilgrims in all directions except towards the north; now there were no pilgrims going towards the north, as no railways led there. But his report on the subject evidently was not deemed worthy "of the fullest criticism, or the most thorough investigation into the arguments and facts," as Surgeon-General Burnell was invited to resubmit it. This, however, was not done by that officer.

B. *Steamboats.*—That ships do carry cholera is shown by evidence so strong that I must confess I do not see how it could be stronger. The evidence of all the epidemics that have occurred in England is irrefutable on this point. The same also with the outbreaks in America. To take one example. On October 10, 1871, four days after the last case of cholera at Stettin, the ss. *Franklin* sailed thence for New York, with 486 'tween deck passengers, 55 cabin passengers, the ship's company, a cargo of merchandise, and 19 bales of rags packed in canvas. On the tenth day out cholera broke out. By November 6, when the ship arrived in the quarantine harbour at Halifax, forty-two men had died of the disease. On November 6 and 7, two men from Halifax went on board, and were employed in coaling and watering, and were "exposed for some hours to the poisoned air of the ship." Both were seized with cholera on the same day. From one of them the disease extended to his family, and then in widening circles through his village. No cholera had been present in Nova Scotia since the spring of 1866, when the ss. *England* had arrived with cases on board. This ship also brought the disease, the whole western hemisphere having been free for some years previously from cholera.

4. THE HOSPITAL ASSISTANT ARGUMENT.—This venerable argument would seem apparently to be impervious to the effects of

senility, and to ripen and mellow like wine. It is this: The hypothesis concerning human intercourse cannot be true, inasmuch as hospital attendants are never attacked with greater frequency than other classes of the community. Putting aside the fact that when occasion favours they *are* more attacked, the whole question is begged by this line of argument. For by it human intercourse is interpreted as contagion. But human intercourse may signify contagion in some instances, and may signify nothing of the kind in others. The same line of argument might be applied to enteric fever. Nurses do not as a rule catch enteric fever from enteric fever patients, and therefore it might be held that enteric fever is never spread by human intercourse. In order, however, finally to dismiss this argument, it is only necessary to state that cholera, like enteric fever, does not spread by contagion as smallpox and the other exanthemata, but by infection as distinguished from contagion, by the sick infecting the healthy by means of the contagion of the sick entering the alimentary canal of the healthy with the food. The Sanitary Commissioner for 1877 in his report, par. 142, states as follows: "In order to prove that cases of cholera among attendants are due to contagion, it must be shown that attendants suffered in larger proportion than others." Accepting then this test of the truth or otherwise of the argument, let us now proceed to apply it.

(*a*) In the epidemic in Egypt in 1883, Surgeon-General Irvine in his report stated that the men of the Army Hospital Corps suffered out of all proportion to the men of the other branches of the service.

(*b*) Griesinger's statistics for Moscow for 1830 show the mortality amongst the hospital attendants was 30 to 40 per cent., whilst in the general population it was only 3 per cent.

(*c*) Laveran in Toulon in 1849 showed that out of 179 hospital attendants, 51 died of cholera, or 1 in 3, whilst in the garrison the mortality was only 1 in 15.

(*d*) In Oran, 1865, the mortality in the hospital staff was 8 per 1000; in the garrison only 1·66 per 1000.

(*e*) In 1865, at Toulon and Marseilles, the respective rates of mortality were as follows:—

In the 22nd Regiment	31·75 per 1000.
" 28th "	29·8 "
" 38th "	19·33 "
Hospital attendants	38·60 "

5. THE COINCIDENCE OR STAGE-COACH ARGUMENT.—The theory that pilgrims from a cholera centre bring the disease is held to be as valid as a theory that in the old coaching days the coach brought the hoar-frost in the winter. Frost in the month of December, succeeding a date on which the coach from London had arrived, could be held to have been brought by coach on as

valid grounds as that cholera attacking villages immediately after the arrival of cholera-infected pilgrims, could be held to have been imported by these pilgrims. Space forbids any consideration of this argument. Suffice it to say that the opinion of the Sanitary Commissioner for 1867 does not agree with that of the Sanitary Commissioner for 1879 as regards coincidence, as shown previously in the Report for 1867, par. 307.

6. THE LOGICAL METHOD OF REASONING ARGUMENT.—We are told by the Sanitary Commissioner with the Government of India for 1879, that in the investigation of cholera our inferences ought not to be drawn from a number of *single* cases, but that rather the etiology of the disease should be adjudged from a consideration of the subject *generally* as a whole. But a whole is generally held to be made up of its parts; and if the single parts point to one conclusion, it may be safe to express the opinion that the whole points identically to the same opinion. Again. the Sanitary Commissioner claims that by virtue of his office he has enjoyed paramount opportunities for formulating his theory of cholera, that it is due "to climatic and other conditions affecting certain localities," inasmuch as he has been able to judge of India as a whole. He denies that the civil or military surgeon serving in cholera camps, in the plains, is capable of forming a correct judgment merely from local outbreaks. But the greatest master of geographical pathology, Prof. Hirsch of Berlin, has enjoyed still greater facilities in this direction; and from a survey of cholera as it has appeared in *all* countries, he holds it communicable by human intercourse, and sums up thus: "That it is human intercourse which furnishes the media for this communication, is proved on a large scale by the observations on the diffusion of the disease by pilgrimages and military campaigns, both in India and beyond it; whilst there are other conclusive proofs, furnished in innumerable instances from the smaller circles of diffusion."

7. THE DIRECTION OF THE EPIDEMIC ARGUMENT.—As regards the epidemic from Hurdwar in 1879, it is argued by the Sanitary Commissioner for 1879 that there is no connection between it and the dispersal of the pilgrims, inasmuch as very little cholera occurred in the Bengal Province. Unfortunately this is an argument that overreaches itself. Why did very little cholera occur in Bengal? For the very simple reason that very few pilgrims came from this part of India, and consequently very few pilgrims returned to it Professor Simpson thinks that at most only one thousand out of nearly a million pilgrims came from Bengal.

8. THE HILL STATION ARGUMENT.—With regard to the confutation of this argument, I cannot do better than quote the words of Surgeon-General A. C. De Renzy, C.B., a former Sanitary Commissioner of the Punjab. He thus writes: "There are two surprising mis-statements in para. 57 of the 9th Annual Report of the Sanitary Commissioner with the Government of

India. The fact that the well-elevated hill station almost always escapes cholera, and the exceptions to this rule are inexplicable on the theory of human intercourse. After such a statement, it will surprise the reader to find that Murree, the most elevated of all the hill stations, has suffered terribly in three out of the eight epidemics which have visited the Punjab since the annexation. There are, in fact, few Punjab stations which have suffered more frequently or more severely. At p. 122 it is stated that the Murree depôt has suffered twice before from cholera, once in 1858, and again to a slight extent in 1867. It will be observed that in giving the previous cholera history of Murree, the statement is restricted to the history of the depôt, apparently for the purpose of ignoring the terrible sufferings of the native population of the sanatorium, in the midst of which the depôt stands." And Dr. De Renzy goes on to show that with regard to Simla a similar mis-statement was made. Murree has since these words were written again suffered terribly from cholera. Dharmala, another hill station, also suffered from a very severe epidemic some years ago.

9 and 10. THE *IPSE DIXIT* AND EXPERIENCE OF INDIA ARGUMENTS.—These two arguments may be examined together. In his last brochure on cholera, published in 1884, the Sanitary Commissioner with the Government of India claims to set forth "a few of the great facts showing what has been the experience of India as regards the disease." In the work in question the experience of India is then claimed as showing that human intercourse is never connected with the diffusion of cholera. But is this the experience of India? India as a whole is made up of the Madras and Bombay Presidencies, and of the Bengal Presidency, comprising Assam, Bengal, N.W.P., and the Punjab. Now for the *facts*. Dr. Cornish, the Surgeon-General of Madras, declared at the inauguration of the Madras Branch of the British Medical Association, that "he was bound to say there that all his individual experience, extending over thirty years, would lead him to deal with the epidemic form of cholera as favoured in its diffusion under certain circumstances by human intercourse." Surgeon-General M. C. Burnell, his immediate successor, at the annual meeting of the same society, declared that his opinion, after "forty years' experience" of the disease, was that water contaminated with cholera dejecta was the cause of cholera epidemics. Surgeon-General Moore of the Bombay Presidency has placed on record not only his belief in human intercourse, but even that the disease can be carried by *flies*. Surgeon-General Townsend for the Central Provinces and the Punjab, and Surgeon-General Payne for Bengal, and Surgeon-General De Renzy for Assam and the Punjab, have expressed the same view. Surgeon-Major Geoffrey Hall of the N.W.P., at a debate on the disease at the N.W.P. Branch of the B.M.A., said that he had never met a man who agreed with the views

of the Sanitary Commissioner for 1879. Surgeon-Major Deakin of the N.W.P. held the same opinion. Surgeon-General T. Murray addressed an inquiry to 481 medical officers as to the transference of the disease by direct intercourse; 363 answered in the affirmative. Again, Surgeon-General Irvine for Assam believed in human intercourse. Well, we have thus shown that the opinion for Madras, Bombay, the Central Provinces, Assam, Bengal, N.W.P., and the Punjab is in favour of propagation by human intercourse. There does not remain, in fact, much of India left. The above testimony means that the testimony of the above various surgeons-general in its totality is the testimony of the whole of Hindostan, a testimony gathered in most cases from a lifetime spent in the country, and finally a testimony totally opposed to what was declared by the Sanitary Commissioner with the Government of India in 1884 to be "experience of India" at the time.

11. THE NON-SPREAD BY WATER ARGUMENT.—In the Ninth Annual Report of the Sanitary Commissioner with the Government of India, the spread of cholera by means of water is declared to be a mistake. As an answer to this, I will now relate the history of cholera as it is shown by Dehra Doon, the last station at which I was located in India. Cholera appeared in Dehra Doon in 1887, 1890, 1892, and 1896. Dehra Doon lies at the foot of the Himalayas. Nearest the hill station of Mussooree are the lines of the 2nd Battalion, 2nd (P.W.O.) Goorkha Rifles; then come those of the 1st Battalion; and, lastly, the regimental hospital. In 1887 the water supply for the regiment was taken from the Tons stream, above the source of which are Mussooree and Jharipani, and the hill slopes below them. All the accumulated filth on these slopes is washed in to the Tons on the occurrence of the first heavy downfall of rain. Numerous filthy villages are on the banks of the Tons, also many villages on the canal from which the water supply is taken off.

In 1887 cholera was present in the villages. The first heavy rainfall occurred on June 28; on July 1 epidemic cholera broke out in both battalions severely and almost simultaneously.

In 1890 a most excellent new water supply had been delivered to the 2nd Battalion, taken off from a copious natural spring. From the pucca reservoir it was led by pipes into the lines. There is no village above the source of the water. The water supply of the 1st Battalion, of No. 8 Mountain Battery which had been added to the garrison, and to the hospital, remained as before. In 1890 cholera was again prevalent in the villages. The first heavy rainfall occurred on June 29. Cholera broke out epidemically on July 2 in the 1st Battalion, the Mountain Battery, and the hospital. No cases occurred in the 2nd Battalion lines.

In 1892 the new water supply had been extended to the 1st Battalion lines and the Mountain Battery, but not to the hospital. Cholera broke out at Hurdwar on March 9, and after some of the pilgrims had returned through Dehra, there occurred a severe epidemic in the city and nearly all the villages in the Dehra Doon valley. This epidemic is said to have been the worst ever known in the Doon. There was now *no* epidemic in either the 1st or 2nd Battalions; but cases occurred in connection with the hospital, which had not yet the new water supply. There was also no epidemic in the Mountain Battery.

In 1896 cholera was again virulent in Dehra about July 12. The new water supply was now extended to the hospital. There was no epidemic in either the two battalions nor the hospital.

I have thus submitted this climatic theory to the fullest criticism, and it is found wanting. What else could be expected of a theory that was described by the late Professor Parkes of Netley as "revolutionary," and by his successor, Professor De Chaumont, as "Nihilistic"?

In conclusion, we have now seen how the Sanitary Commissioner with the Government of India for 1879 differed from the Sanitary Commissioner with the Government of India for 1867: on every point exactly opposite conclusions are drawn. Now it may be argued that the initial circumstances of place or of mode of dispersal of the pilgrims were different in 1867 and 1879, otherwise how can such diametrically opposite views of the two occurrences be explained? But this argument will not hold water, for the Sanitary Commissioner in 1879 expressly declared that the attendant circumstances were nearly exactly the same as in 1867. Such, then, being the case, it will be, to say the least, surprising to learn that the Sanitary Commissioner with the Government of India for 1867 is *one and the same identical officer* as the Sanitary Commissioner with the Government of India for 1879. Lastly, inasmuch as the views of the officer for 1879 had changed from those he held in 1867, it might have been supposed that any one holding the more general view of Indian sanitarians would meet with a certain amount of tolerance. Indeed, in his brochure, "Cholera: what can the State do to prevent it?" the Sanitary Commissioner on p. 106 thus writes: "It has been asserted that medical officers in India have been discouraged and indeed prohibited from reporting facts which favour the contagion theory of cholera. A more groundless assertion was never made." But we have already related the Berar order. And in 1882, Surgeon-General Burnell of Madras, an officer of thirty-six years' service, when as Sanitary Commissioner of Madras he transmitted his Annual Report to the Sanitary Commissioner with the Government of India, embracing convincing evidence of the propagation of the disease by the pilgrims dispersing from Tirupati, was severely animadverted on for such an expression of opinion. How can such a change of opinion be accounted for? The late Professor Maclean, the Professor of Military Medicine at Netley, on p. 231 of his work on the "Diseases of Tropical Climates," thus writes concerning this change of opinion:—"It is impossible to resist the conclusion that, consciously or unconsciously, political considerations weighed with this able officer when he changed his opinion in this remarkable manner. It is certain that the Government of India were alarmed lest, if it could be established that cholera followed the great lines of human intercourse, foreign nations, in their jealousy of British commercial prosperity, should establish, to the detriment of Indian trade, quarantine regulations of an oppressive character. It is certain that Dr. Cuningham and some of the high officials of the Civil Government lost no opportunity in expressing in strong terms their opinion that to reason from facts before them, showing the influence of human intercourse or water on propagating cholera, was highly culpable, and a practice to be reprobated. Any other theory than the one advocated in the Annual Reports of the Sanitary Commissioner with the Government of India was wrong, and the officer who sinned in this way was branded as a mischievous theorist."

With these plain words of my former distinguished teacher, whose eloquent lectures portrayed in stirring language the intricate nature of tropical disease, and whose generous and warm-hearted pen was always at the service of his brother officers, I conclude this account of the theory of cholera as it was formerly ordered in India by Surgeon-General J. M. Cuningham, C.S.I., Sanitary Commissioner with the Government of India.

ON "THE TRUE ELIXIR OF LIFE."

By John Haddon, M.A., M.D.

Alchemy is to modern chemistry what astrology is to astronomy, or legend to history. In the eye of the astrologer, a knowledge of the stars was valuable, only as a means of foretelling, or even influencing, future events. In like manner, the genuine alchemist toiled with his crucibles and alembics—calcining, subliming, distilling, not with a view to discover the chemical properties of substances, as we understand them, but with two grand objects, as illusory as those of the astrologer—to discover, namely, (1) the secret of transmuting the baser metals into gold and silver; and (2) the means of indefinitely prolonging human life. Tradition points to Egypt as the birth-place of the science, and it is very suggestive that man, in such early days, had his mind set on those two objects, gold and long life. Their desire was to make gold from the baser metals, and to find some drug which would lengthen their days. The Greeks and Romans took up alchemy from the Egyptians, but it was from the Arabs that the name came. *Chemia* (Gr. *Chemeia*) meant the conversion of silver and gold; and if we take it as a generic term, embracing all common chemical operations, such as the decoction and compounding of ordinary drugs, the grand operation of transmutation was called by the Arabs "*the chemia*" (alchemy), the chemistry of chemistries. The Roman emperor, Caligula, is said to have instituted experiments for producing gold out of orpiment (sulphuret of arsenic); and in the time of Diocletian the passion for that pursuit, conjoined with magical arts, had become so prevalent in the empire, that that emperor is said to have ordered all Egyptian works, treating of the chemistry of gold and silver, to be burnt. For, at that time many books were appearing, written by Alexandrine monks and by hermits, but bearing famous names of antiquity, such as Democritus, Pythagoras, and Hermes.

At a later period, the Arabs took up the art, and it is to them that European alchemy is more directly traceable. The school of Polypharmacy, as it has been called, flourished in Arabia during the Kalifates of the Abbasides. The earliest work of this school, now known, is the "Summit of Perfection," composed by Gebir, in the eighth century, and may be regarded as the oldest book on chemistry in the world. It contains so much of what sounds like jargon, in our ears, that Dr. Johnson ascribes the origin of the word "gibberish" to the name of the compiler. Yet, when viewed in its true light, it is a wonderful performance, being a kind of text-book, or collection, of all that was then known and believed. Gebir taught that there are three elemental chemicals —mercury, sulphur, and arsenic. They saw mercury dissolve gold, the most incorruptible of matters, as water dissolves sugar; and a stick of sulphur, presented to hot iron, penetrate it, like a spirit, and make it run down in showers of solid drops, a new and remarkable substance, possessed of properties belonging neither to iron nor sulphur. With excusable errors in theory, the Arabians toiled away at the art of making "many medicines" (polypharmacy) out of the various mixtures and reactions of such chemicals as they knew. Their scientific creed was, transmutation, and their methods were mostly blind gropings; nevertheless, in that way, they found out many new bodies, and invented many a useful process. From the Arabs, alchemy found its way through Spain into Europe, and became entangled with the subtleties of the scholastic philosophy. In the Middle Ages it was chiefly the monks who occupied themselves with alchemy.

The earliest authentic works, now extant, on European alchemy, are those of Roger Bacon, who died in 1284, and Albertus Magnus, who died in 1280.

Roger Bacon is the greatest man in all the school, and was acquainted with gunpowder. Although he condemns magic, necromancy, charms, and all such things, he believed in the convertibility of the inferior metals into gold, but does not profess to have ever effected the conversion. He had more faith in the elixir of life than in gold-making. He followed Gebir, in regarding potable gold—that is, gold dissolved in nitro-hydrochloric acid or aqua regia—as the elixir of life. Urging it on the attention of Pope Nicholas IV., he informs His Holiness of an old man who found some yellow liquor (the solution of gold is yellow) in a golden phial, when ploughing one day, in Sicily. Supposing it to be "due," he drank it off. He was thereupon transformed into a hale, robust, and highly accomplished youth; and Bacon, no doubt, took many a dose of golden water himself.

Thomas Aquinas also wrote on alchemy, and was the first to employ the word "amalgam." He also was the first to introduce the use of chemical symbols. He made *much* of the spirit of wine, and called it *aqua vitæ ardens.* In his enthusiasm he pronounced it the very elixir of life.

One of the most celebrated of the alchemists was Basil Valentine, who died in 1394. He introduced antimony into medical use, and is ranked as the founder of analytical chemistry.

But more famous than all was Paracelsus, in whom alchemy proper may be said to have culminated. With him everything was either a salt, a sulphur, or a mercury; or, like the metals, it was a "mixt," or compound. There was one element, however, common to the four; a fifth essence, or quintessence, of creation, an unknown, and only true element, of which the four generic principles (salt, sulphur, mercury, or a "mixt") were nothing but derivative forms or embodiments; in other words, he taught that there was only one real elementary matter, nobody knows what. This one prime element of things he appears to have considered to be the universal solvent, of which the alchemists were in quest, and to express which he introduced the term "Alcahest," a word of unknown etymology, but supposed to be derived from the German words *Alle Geist*, All Spirit. He seems to have thought that if this quintessence, or fifth element, could be got at, it would prove to be both the philosopher's stone and the elixir of life. After Paracelsus, the alchemists of Europe became divided into two classes. The one class was composed of men of diligence and sense, who devoted themselves to the discovery of new compounds and reactions—practical workers, and observers of facts, and the legitimate ancestors of the positive chemists of the era of Lavoisier. The other took up the visionary fantastical side of alchemy, and carried it to a degree of extravagance. Instead of useful work, they compiled mystical trash into books, and fathered them on Hermes, Aristotle, Paracelsus, and other really great names. They talk of the powder of attraction, which drew all men and women after its possessor; of the "alcahest," and the grand elixir, which was to confer immortal youth upon the student, who should approve himself pure and brave enough, to kiss, and quaff, the golden draught. It was those visionaries who formed themselves into Rosicrucian societies, and other secret associations. It was also in connection with this mock alchemy, mixed up with astrology and magic, that quackery and imposture so abounded, as is depicted by Scott, in the character of Dousterswivel, in the "Antiquary." So much for alchemy, and now we must follow the development of its more sensible branch.

Lavoisier, who was born in 1743, was the founder of the antiphlogistic, or modern chemistry. He discovered the place of oxygen in the process of combustion and acidity, and proved that water could be formed by burning oxygen and hydrogen together, and that it can be decomposed into the same elements. He and his associates invented a new chemical nomenclature, which was very generally adopted, and from his day chemists have continued their researches, in the true scientific spirit, with marvellous results. But can we not still trace, though it may be more faintly, than even in Dousterswivel's day, the propagation of the other branch, into which the ancient alchemists divided? Have we not still among us some who, if they do not resort to magic, are still seeking, if not the old elixir of life, some drug which is to cure all diseases, incident to humanity, and to make the old, once more, young?

I regret to have to confess, that there is a class of chemists, to-day, known as pharmaceutical chemists, whose aim is to discover and prepare drugs, which have some action upon the human body. When they have discovered them, they lose no time in introducing them to the notice of the medical profession, and that profession is too apt to be led away by the alleged properties of such drugs, and to use them in the treatment of diseases or symptoms for which they are said to be so well suited. These chemists seem to me to be the direct and continuous descendants of the Dousterswivel branch of the alchemists, and, I greatly fear, do much more harm, through the stupidity of the medical profession, and the gullibility of the public, than their prototypes could do.[1] The multiplication of drugs and their promiscuous use has indeed reached such a crisis, that the rational physician is beginning to look with some anxiety to the future of the profession. If polypharmacy is to hold sway, the physician must become extinct, or degenerate into the mere dispenser of drugs. When we look at the Surgery of to-day, we see a very different state of matters. The surgeon has, as it were, thrown "physic to the dogs," taken up the knife, and proclaimed his power to cure, by his art, all curable diseases, leaving to the physician only those which are incurable. No one can help admiring the advances that have been made by the surgeon, more especially when contrasted with the comparative stagnation of the physician; but is it not possible that he too may be led away, in his enthusiasm, and think that the knife is the great panacea, the only elixir of life which man can discover? I think it is, and I have little doubt that to the knife, more especially in the hands of incompetent surgeons, may be ascribed the death of many, who, but for their interference, might have lived valued and useful lives. There are signs, however, that a new division is about to take place among physicians, the effect of which may be to prevent, even many of the diseases which the surgeon is called upon to treat, and prove to be as great an epoch in the history of medicine, as the division which took place among the alchemists, proved in the history of chemistry—a division, namely, into those physicians who discard drugs in favour of diet, and those who continue to believe in, and prescribe drugs.

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[1] If such chemists have given up the quest of the philosopher's stone, they manage to get gold, by selling elixirs, but not of life.

The history of food reform, in Europe, dates at least as far back as the time of Pythagoras, who died in 497 B.C. He was not only a great athlete, having distinguished himself as such at the Olympic games, but he was a great philosopher as well. His system of the universe, in which he placed the sun in the centre, and all the planets moving round it in ellipitical orbits, was deemed absurd, until it was proved to be correct in the 16th century. So greatly was he venerated, that, at his death, he received the same honours as the immortal gods, and his house became a sacred temple. He taught his followers to abstain from eating the flesh of animals and beans, and he is generally regarded as the originator of vegetarianism in Europe. It seems probable that his views with regard to food may have been derived from his intercourse with the natives of India, who, from religious motives, killed no animals, and lived on the produce of the vegetable kingdom alone. Suetonius describes the Pythagorean diet as consisting of bread sopped in cold water, and of some sorts of apples of an agreeable acidity. Plato, who died in 347 B.C., in his "Republic," makes Socrates state his opinions upon the best diet for the people:—

"They will live, I suppose, on barley and wheat, baking cakes of the meal and kneading loaves of the flour. And spreading these excellent cakes and loaves upon mats of straw or on clean leaves, and themselves reclining on rude beds of yew or myrtle boughs, they will make merry themselves and their children, drinking their wine, wearing garlands, and singing the praises of the gods, enjoying one another's society, and not begetting children beyond their means, through a prudent fear of poverty or war."

Glaukon interrupts him, saying, "Apparently you describe your men as feasting without anything to relish their bread."

"True," says Socrates, "I had forgotten. Of course they will have something to relish their food. Salt, no doubt, and olives and cheese, together with the country fare of boiled onions and cabbage. We shall also set before them a dessert, I imagine of figs, peas, and beans; they may roast myrtle-berries and beech-nuts at the fire, taking wine with their fruit in moderation; and thus, passing their days in tranquillity and sound health, they will in all probability live to an advanced age, and, dying, bequeath to their children a life in which their own will be reproduced."

Upon this Glaukon exclaimed, "Why, Socrates, if you were founding a community of swine, this is just the style in which you would feed them up." And he says he thinks they should live in a more civilised manner, having couches, tables, and "the usual dishes and dessert of a modern dinner."

"Very good," says Socrates, "I understand. Apparently we are considering the growth not of a city merely, but of a luxurious city. I dare say it is not a bad plan, for by this extension of our inquiry, we shall perhaps discover how it is that justice and injustice take root in cities. Now, it appears to me, that the city which we have described is the genuine and, so to speak, healthy city. But if you wish us to contemplate a city that is suffering from inflammation, there is nothing to hinder us. Some people will not be satisfied, it seems, with the fare, or the mode of life, which we have described, but must have, in addition, couches and tables, and every other article of furniture, as well as viands. Swine-herds, again, are among the additions we shall require—a class of persons not to be found, because not wanted, in our former city, but needed among the rest in this. We shall also need great quantities of all kinds of cattle, for those who may wish to eat them, shall we not?"

"Of course we shall," says Glaukon.

"Then," Socrates asks, "shall we not experience the need of medical men, also, to a much greater extent under this than under the former *régime?*"

"Yes indeed," admits Glaukon.

"The country, too," continues Socrates, "I presume, which was formerly adequate to the support of its then inhabitants, will be now too small, and adequate no longer. Shall we say so?"

Glaukon admits he is right.

"Then," says Socrates, "must we not cut ourselves a slice of our neighbour's territory, if we are to have land enough both for pasture and tillage? While they will do the same to ours if they, like us, permit themselves to overstep the limit of necessaries, and plunge into the unbounded acquisition of wealth."

"It must inevitably be so," says Glaukon; and he further admits that the next step must be war.

"At this stage of our inquiry," says Socrates, "let us avoid assenting either that war does good or that it does harm, confining ourselves to this statement, that we have further traced the origin of war to causes which are the most fruitful sources of whatever evils befall a state, either in its corporate capacity or in its individual members."

So he goes on, and shows that lawyers will also be needed through the dissoluteness produced by luxurious diet, and he concludes thus—

"And do you not hold it disgraceful to require medical aid, unless it be for a wound, or an attack of illness incidental to the time of the year—to require it, I mean, owing to our laziness, and the life we lead, and to get ourselves so stuffed with humours and wind, like quagmires, as to compel the clever sons of Asclepios, to call diseases by such names as flatulence and catarrh?" (Book III.)

Thus it is evident that this, the wisest of the Greeks, had been a careful observer, and had not neglected the study of diet.

In "The Laws," he writes: "I observe that men's thoughts and actions are intimately connected with the threefold need and desire (accordingly as they are properly used or abused, virtue or its opposite is the result) of eating, drinking, and sensual love." He himself was remarkable for the extreme frugality of his living, and was such an eater of figs that he was called the "lover of figs."

But the Greeks in general were noted among Europeans for their abstemiousness, the Athenians and Spartans being specially noted for frugal diet. The comic poets refer, in terms of ridicule, to what seemed to them an inexcusable disregard of the "good things" of life on the part of the refined people of Attica.

Professor Mahaffy, in his work "Ancient Greek Life," points out that slaughter-houses and butchers are seldom or never mentioned in Greek literature. "The eating of (flesh) meat," he observes, "must have been almost confined to sacrificial feasts, for in ordinary language butcher meat was called victim (ἱερεῖον). The most esteemed or popular dishes were "madsa," a sort of porridge of wheat or barley, various kinds of bread, honey, beans, lupines, lettuce and salad, onions and leeks. Olives, dates, and figs formed the usual fruit portion of their meals. In regard to non-vegetable food, fish was most in demand.

Pythagoras had many disciples, and, amongst others, was Seneca, the Roman philosopher. When, however, the early Christians, who were vegetarians, reached Rome, Seneca's father persuaded him to give up vegetarianism, lest the Emperor Nero should think he had adopted the new religion, and kill him. The Christian Fathers, up to the time of St. Chrysostom, endeavoured to continue vegetarianism as a part of Christianity, but, when the Christian became the fashionable religion of Rome, vegetarianism was departed from, and its practice was not renewed in Europe, until the revival of learning occurred, and the works of the Greek and Roman philosophers were read in the schools. Food reform was then studied and practised from a health point of view, and Cornaro, whose book was published in the 16th century, is perhaps the earliest and best advocate of abstinence and self-denial in eating, as the secret of a long and happy life.

Sir Thomas More, a great and good man, in the reign of Henry VIII., in his "Utopia," condemns hawking and hunting as unworthy of freemen; and he makes criminals, who had been degraded from citizenship, the butchers; for free citizens were not allowed to kill beasts. The "Utopians" kill no animal in sacrifice, nor do they think God has delight in blood and slaughter, who has given life to animals to the intent that they should live. Their drink was either wine, made of grapes, or else of apples or pears, or water alone. He further condemns the converting of arable into grazing land, through covetousness, pointing out how the increase of flocks and herds has brought disease upon men, thrown many out of employment, and raised the price of food. He may be regarded as one of the early advocates of food reform, from humanitarian considerations, as Cornaro was, from a purely health point of view, and along these two lines we can trace food reformers up to the present day. Among them, I am glad to think, that there were some doctors; for, it is to the medical profession we must look to carry food reform into the homes of the people.

Among the doctors who learned the value of a simple diet I may take Dr. Cheyne, who died in 1743, as an example. He was descended from an old Scottish family, studied medicine at Edinburgh, and practised in London. High living brought upon him giddiness, violent headaches, and depression of spirits. He gave up his convivial habits, and was in consequence abandoned by his former companions. He retired to the country, under the impression that his health would never be restored, and began to reflect on the follies and vices of the ordinary way of living. He restricted his diet, and took much exercise, by which his health seemed to be restored, in his forty-second year. He then became less careful of his diet, and again relapsed. He consulted Dr. Arbuthnot, who advised him to adopt a milk and vegetable diet, which restored him to comparative health once more; and he did not again relapse into his former dietetic errors. In the preface to his Essay of "Health and a Long Life," he tells us that it was published for the benefit of those weakly persons who "are able and willing to abstain from everything hurtful, and to deny themselves anything their appetites craved, to conform to *any* rules, for a tolerable degree of health, ease, and freedom of spirits. It is for these, and these only, the following treatise is designed. The robust, the luxurious, the pot-companions, etc., have here no business, their time is not yet." Though his essay added to his reputation, it exposed him to abuse. Thus he writes: "Some good-natured people and ingenious retainers to the profession, on the publication of my book on 'Long Life and Health,' proclaimed everywhere that I was turned mere enthusiast, advised people to turn monks to run into deserts, and to live on roots, herbs, and wild fruits. In fine, that I was, at bottom, a mere leveller, and for destroying order, ranks, and property, every one's but my own. But that sneer had its day, and vanished into smoke. Others swore that I had eaten my book, recanted my doctrine and system (as they were pleased to term it), and was returned again to the devil, the world, and the flesh. This joke I have also stood. I have been slain again and again, both in prose and verse, but, I thank God, I am still alive and well."

Even yet, medical men who venture to advocate food reform are treated no better by some of their brethren, but Dr. Cheyne persevered, and was rewarded for his abstinence and self-denial. In 1740 he published an "Essay on Regimen," in which he writes: "The question I design to treat of here is, whether animal or vegetable food was, in the original design of the Creator, intended for the food of animals, and particularly of the human race. And I am almost convinced, it never was intended, but only permitted as a curse or punishment."

Again in his "author's case," written towards the end of his life, he says: "My regimen at present is milk, with tea, coffee, bread and butter, mild cheese, salads, fruits and seeds of all kinds, with tender roots (as potatoes, turnips, carrots), and in short everything that has not life, dressed or not, as I like it, in which there is as much or a greater variety than in animal foods, so that the stomach need never be cloyed. I drink no wine nor any fermented liquors, and am rarely dry, most of my food being liquid, moist, or juicy. Only, after dinner, I drink coffee or green tea, but seldom both in the same day, and sometimes a glass of soft, small cider. The thinner my diet, the easier, more cheerful and lightsome I find myself; my sleep is also sounder, though perhaps somewhat shorter, than formerly, under my full animal diet; but then, I am more alive than ever I was. As soon as I wake, I get up. I rise commonly at six, and go to bed at ten."

He further tells us (after sixteen years of a milk and vegetable diet) that he was eating only half of what he did at first, and that, if he lives a few years longer, he will probably have to reduce his diet another half, to preserve his freedom and clearness. His diet *then*, was, three Winchester pints of new milk and 6 oz. of biscuit, made without salt or yeast, baked in a quick oven. As to his experience in the treatment of disease by diet, he writes: "There are some cases wherein a vegetable and milk diet seems absolutely necessary, as in severe and habitual gouts, rheumatisms; cancerous, leprous, and scrofulous disorders; extreme nervous colics, epilepsies, violent hysteric fits, melancholia, consumptions, and towards the last stages of all chronic distempers. In such distempers I have seldom seen such a diet fail of a good effect at last."

The list of diseases that could be cured by diet in his day is large, but it is larger now, and is being added to, as experience teaches. Dr. Cheyne exemplified in his death, the value of his principles, breathing his last tranquilly and retaining his senses to the end.

Since his day there have been other doctors, equally convinced of the value and efficacy of a bloodless diet, nevertheless the profession, as a body, has still to be converted to the simpler food, which I have no doubt it will be, in time. Doctors have done much already in preventing disease by the attention they have paid to the study of sanitation, and if the knowledge we *have*, were honestly acted upon, the death-rate would be diminished much more than it has been; but we must not forget that, as doctors prevent disease, they, as it were, pick their own pockets. The epidemics of infectious diseases, which ought by this time to be stamped out of the country, used to be the harvests of the doctors; now the epidemics are few and far between, and in the large towns, when they do occur, the victims are removed to the hospital, and taken care of, till they die or recover. There can be no doubt that the Public Health Act has had much to do in reducing the work, and consequently the income, of every practitioner of medicine, until some can hardly pay their way. If sanitation has made such a change in medical practice, the study of food and the adoption of a right diet will make a far greater change; for when the system is not polluted by eating stupidly, and the various organs of the body are not overtaxed, the blood will be so pure as to resist, perhaps, even our various infectious diseases. And I feel sure that so soon as the profession knows, that so much depends upon the quantity and quality of the food we eat, it will not hesitate to give the public the benefit of such knowledge, even though it should lead to the total extinction of the profession. How such knowledge is to be given to the profession, is at present the most pressing question, and the best way to do so, would be to establish a chair of dietetics in connection with every medical school throughout the empire. If that were done, our knowledge of the subject would be put before the students, and in a few years, by their observation and study of diet, the science of dietetics would be much improved.

Until that is done, food reformers must do their best to make themselves heard, and urge every one to study diet, for his own sake. The more I study diet, the more I am convinced that physiologists are entirely wrong, in the views they hold with regard to the amount of food required by a healthy man, to keep him in the best possible physical condition; and a dreadful responsibility rests upon them for so grossly misleading the medical profession. I am perfectly confident, that it is the habit of putting into the stomach, more than the system requires, that accounts for most, if not for all, the diseases from which we suffer.

I became a vegetarian from necessity, I am now a vegetarian from conviction, believing that it was from the vegetable kingdom that primitive man derived all his food, and that it is able still to yield him all that he requires. But we must not forget that vegetarians even, may, and no doubt many do, eat a great deal more than they should, and in consequence may suffer, just as if they were eating animal food.

I am inclined to think that the quantity is as important as the quality of our food, and I am quite sure that, both in health and disease, *they* will feel best, and live longest, who are most able to practise abstinence and self-denial in eating; and I would call such abstinence the true and only elixir of life. It is not like the elixir of which the alchemists dreamt. It cannot be swallowed at a gulp, and act as a charm. No, self-denial is difficult, and must be practised daily; but it grows by being practised, and soon the reward will be so great that the abstainer, comparing his former with his latter state, will be so satisfied with the improvement, and have gained such power of self-denial, that no temptation will make him relapse. From my own experience I believe there is no harder task you can set a man or woman, who has acquired the habits of civilisation as to eating, than to ask them to restrain their appetite for food, or disregard the dictates of the palate, whether they are flesh-eaters or vegetarians. I have discovered, that what we call hunger, is not the system calling for something to supply it with energy, but only the stomach demanding its accustomed meal; and, what is quite as important, I have proved, that in a very short time, the stomach can be trained, or educated, to desire food, only when we choose to eat —it may be, only once in the day. The ancient Romans ate only once a day. Many of the natives of India eat only once a day, living mostly upon rice; the Trappists eat only once a day, and are vegetarians; and I have read of a well-authenticated case of a man who lived till he was 180 years of age, who ate only once a day, fasted twice every month, and seldom ate butcher-meat. It is evident, therefore, that we can eat as much at one time, even of vegetarian food, as is sufficient for a whole day. With such a fact, how can we justify or excuse our present eating habits? Among the many lessons we have learned from the South African war, one of the war correspondents wrote, that *one* of them was the absurdity of our eating so often as we did. He saw that the soldier, with nothing but a biscuit and a cup of coffee at four o'clock in the morning, could march till four in the afternoon, when, if the waggons were up, he would have a meal, and he wished no more till next morning. If the soldier, in war, can live and thrive on what we would regard as only one good meal, surely we, who have so much less exercise, need not be afraid of following his example. What a revolution it would make in domestic life if we were wise, and resolved to eat only once a day! and if we further resolved to refrain from all cooked food, which we might easily do with *great* advantage, the dearth of cooks and servants generally, would give us no thought—for it is the eating that causes most work in a house.

But if abstinence, both with regard to quantity and quality of food, be the true and only elixir of life, it follows that the want of such abstinence is the very elixir of death. How sad it is to think, that some of our best men, men whose lives are precious, not only to themselves and to their families, but to the nation, nay to the whole world, are eating and drinking *that* which is slowly but surely hastening them into their graves! It is an old but a true saying, that we dig our graves with our teeth. Who will convince men of its truth and set them in a better way? Humanitarian vegetarians are doing their best, and they are, according to report, more successful than ever. The hygienic vegetarians are said to be less successful, and are mostly recruited from the ranks of those who have broken down in health, and can no longer eat and drink with impunity, with whom it is no virtue to practise abstinence. Nevertheless, I have great faith in the persistent efforts of hygienic vegetarians, and believe that in time their work will tell, for *it* must appeal to the medical profession; and once the doctors are converted, food reform will soon follow.

I might explain how food can produce gout, Bright's disease, diabetes, and such like maladies. I might dilate on the various risks we run from eating the flesh of animals, not only from its chemical composition, but from the microbes it may contain. The study of that side of the subject is still in its infancy, but we are daily accumulating facts which lead to the belief, that diseases of animals are very frequently communicated to man through eating their flesh. When one thinks of such a possibility, and remembers, that we can do without *any* animal food, even eggs and milk, one is inclined to regard flesh-eaters as infatuated mortals, and to look upon the butchers' shops, with their rows of carcasses, as dangerous to the health of the people, which the Medical Officer of Health ought to condemn. We think disease arises from bad drains, and we try to keep them right, but continue to pollute and choke up the drains in our bodies by eating, making our blood so impure as to contain the nidus on which all sorts of disease germs grow. How long will it be, till we will be as careful to keep our blood free from pollution as our drains? Very long, I fear; nevertheless, it becomes each one who has realised the dangers that are associated with food, to spread the truth, in the assurance that some day truth will prevail.

But, even when a man has become convinced of the importance of eating nothing, except what the vegetable kingdom produces, and resolves to eat nothing else, he will find some difficulties in his way, both from his friends and from his own ignorance as to the best vegetarian foods. The opposition of his friends he must disregard, but he must study food, and he will soon learn which suits him best. If his digestive organs have not already been injured by eating, he will have no difficulty in digesting any of the vegetarian foods, even the pulses, unless he takes too much of them. I was astonished to hear an old and experienced vegetarian say, that six butter beans were as many as he ate at a meal, they were such a strong food; and it is a fact, that those beginning the simpler foods, are very apt to injure themselves by eating too many peas, beans, or lentils. Pythagoras could live on bread and apples, and many can bear witness to the invigorating effect of nothing but fruit and bread. After living on such a diet myself for four days, on board ship, eating only twice a day, I walked eighteen miles, resting only half an hour when halfway, with wonderfully little sense of fatigue. I was astonished at my performance; so that with whole-meal, Hovis, or Bermaline bread, and fruit, eaten only twice a day, no one need be afraid of losing strength. When one stops eating animal food, however, one is likely to lose weight, unless too much food is taken; and, from what I have been able to learn, I should say that a man, weighing between 10 and 11 stones as a flesh-eater, need not be astonished if he loses a stone, in a very few weeks. Now, to lose weight is considered by the Faculty to be a bad sign, and it may be, without any change in diet; but, as a rule, people gain weight before they begin to lose it, and I have come to regard *that* as the crisis in their life. Once a man or woman, without any change in diet or exercise, begins to gain weight, the digestive powers have undergone a change which will soon show itself in a breakdown of health. What form it will assume will depend upon the individual diathesis. It may be gout, rheumatism, Bright's disease, diabetes, epilepsy, melancholia, mania, or any chronic ailment; but the beginning of the breakdown dates from the time the patient began to gain weight. It is not uncommon for some women to gain over four stones in weight. Then their troubles begin, and unless they come under some enlightened, rational physician, they will continue for years; and, if they live, they will not be well, until they have lost the extra weight which they had put on. Thus, I begin to regard stout people as in a dangerous state, and thin people as most likely to live long. How thin a man may be, and be perfectly safe, I have not yet discovered, but I have carried, at one time, three stones more than at another, and I was in better health and most vigorous when I was lightest; so that I am inclined to believe that we would not be fat, if our systems were not overloaded. But facts are much needed as to the weight of vegetarians, when compared with flesh-eaters; and any one who can and will supply them will render a great service to those studying diet without prejudice.

If, then, any one begins to use the true elixir of life, he will have difficulties, neither few nor small; but I can assure him that, if he perseveres intelligently, he will earn a rich reward. Languor and fatigue will be comparatively unknown. He will be able to do more work, and require less sleep. He will be able to withstand worry, and all the trials of life, better than he ever did. He will lengthen his days and add to his pleasures the greatest pleasure of all, namely, to feel perfectly well.

THE REPORT OF THE INDIAN PLAGUE COMMISSION.

By CHARLES HUNTER STEWART, M.B., D.SC., *Professor of Public Health, University of Edinburgh.*

(*Concluded from page* 52.)

Introduction of plague into uninfected places.—This seems to have been brought about almost entirely by travellers in whom plague was incubating, or who had brought the infection in their effects, though they themselves did not suffer from the disease. That plague has spread so slowly in India, seems to be due to —(1) its short incubation period; (2) the careful measures adopted for detecting plague cases travelling by rail, and for detaining suspicious cases; (3) the measures taken to combat its spread.

As early as October 1896 there was instituted a medical examination of all passengers leaving the stations in Bombay city, and again at selected stations on the outward journey. In February 1897, on the passing of the Epidemic Diseases Act, the arrangements were extended and thoroughly systematised. These involved the medical examination of passengers on certain principal stations on the through lines, and also of those passengers alighting at important centres of population. All suspected persons were detained in special camps provided. At subsidiary stations on the main and branch lines, similar examinations were made at the instance of local governments. These detention camps were later abandoned in Bombay Presidency, and the measures for surveillance of persons from infected areas were extended. Speaking broadly, these latter were as follows:—(1) No person arriving by rail from an infected district was allowed to enter a town unless vouched for by some native gentleman, and intimation of his place of residence given. (2) Householders were required to give a report of all such new arrivals in the town. (3) All these new arrivals had to present themselves for observation at stated periods during ten days.

The danger was greater from travellers by road, who were either incubating plague (sometimes even in the first stage of the disease), or had come from an infected area. But of course the distance such persons could travel who were either incubating or suffering from the disease, was comparatively small. A striking illustration of this is seen in the course of events during the great epidemic in Sholapur at the end of 1897. This town is situated close to the frontier of the territory of Hyderabad, and in this territory rigorous measures had been in force on the railways since February 1897 for preventing the entrance of plague. There were

2200 deaths in Sholapur in five months. Early in the epidemic about one-half of the population fled, and a large number of these was known to have gone into the Hyderabad territory in the hope of escaping plague measures. We learn from the evidence that, "in spite of guards placed on all the roads, they managed to escape, generally at night, and every morning corpses were found lying on the roads leading from Sholapur and in the surrounding fields." Yet, notwithstanding this great ingress of refugees from Sholapur, the plague did not extend more than 60 or 70 miles beyond the frontier. The Hyderabad plague authorities considered this result entirely due to their energetic preventive measures, both on railways and roads. The probability that this was so is much increased by their plague experience since, as up to 1899, notwithstanding the great traffic with the Bombay Presidency, the disease had never got to Hyderabad city.

The number of plague cases detected among railway passengers has been comparatively small. At the twelve detention camps in the Bombay Presidency, during five months in 1897–1898, 131,074 passengers were detained, and among these 201 cases of plague developed. In the following year, when only persons whose temperature was distinctly above normal were detained, there were 160,000 passengers examined during four months; of these only 12,000 were detained, and of these 266 developed plague. But the number of cases discovered does not by any means express the value of the measure. Perhaps its chief value lies in preventing sick persons from leaving infected areas by rail. In the words of Sir Andrew Wingate, whose experience was quite unique, "if these examinations were taken off, I think the whole country would be flooded with plague cases"; and in this view most of the officers who directly superintended this work concur.

The following are among the conclusions of the Commissioners as regards restriction of the movements of travellers by railways:—

"(2) That any system of land quarantine imposed with the object of detaining all passengers from infected areas, either at a point where the infected and uninfected areas join, or at different places within the infected area . . . has not been found in practice to prevent the spread of plague. (4) That any system of medical examination on railways which falls short of keeping travellers under detention for the ordinary period of incubation, must be defective. (6) That it appears to be unnecessary to medically examine people travelling between places in an infected area. (8) That the disinfection of the personal effects of travellers by railways should not be attempted, because—(*a*) disinfection, if carried out at all, should be thorough, and would then cause an amount of delay and inconvenience which will not be justified by the results; (*b*) people, when themselves travelling, can evade the disinfection of their personal effects by despatching them by goods train. The disinfection of articles sent by goods train would be an impossible task."

After discussing the evidence in connection with attempts made in some districts to prevent the spread of plague from infected towns or villages by cordons or similar devices, they state "that under ordinary circumstances the physical characters of the plains of India, covered as they are with countless paths and tracks, present great obstacles to the success of such a cordon. . . . In the rare cases where the physical conditions are favourable to the success of a cordon, the carelessness and venality of the guards on it will bring about failure. And in the great majority of cases the area to be guarded will be so great, and the possibilities of evading a cordon at night so many, that even with establishments which could be implicitly relied on, it will be found impossible to make a cordon an effective means of preventing spread of plague."

Spread of plague over sea to countries outside of India.—The medical inspection of outward-bound vessels at the port of Bombay was systematically undertaken in February 1897, and shortly after at Karachi, Madras, and Calcutta. The rules provided that any persons showing symptoms of plague should be prevented from departing, the inspection being made on board ship, except in the case of pilgrim vessels. After 1898, in consonance with the general principles formulated at the Venice Conference in 1897, such inspection was carried out on shore before embarkation. Only clothing, considered by the Port Medical Authority to be contaminated or suspicious, was at first disinfected; but having in view the possibility of infection being conveyed by clothing, the Commission recommended more stringent measures, and now the rules require the disinfection on shore of the bedding and clothing of native crews, third class or deck passengers, and native servants, in the case of vessels leaving Calcutta, Karachi, or Bombay for ports outside of India. Of 25,011 persons prevented from sailing from Bombay to all ports —Indian, Red Sea, European, etc.—from January 1897 to 15th March 1899, only 243 were known to have developed plague. The examination thus is conducted in such a manner as to obviate the danger of the admission on board ships of persons suffering from overt signs of plague. Short of putting every one in quarantine for the full period of incubation before embarkation, it is impossible to detect cases in the early period of incubation; but even of these very few have embarked. Among 132,000 examined and passed on sailing for Europe, Aden, and the Red Sea ports between January 1897 and 15th March 1899, only four cases of plague occurred.

Under the terms of the Venice Convention of 1897, a healthy ship is defined to be any ship, even though coming from an infected port, which has had no death or case of plague on board, either before departure, during the voyage, or on arrival. Such healthy vessel is entitled to free pratique; but the authorities at the port of arrival *may* impose restrictions, as laid down by the Convention. Healthy vessels, even though the passage from the infected port be less than ten days, get free pratique at Aden if (1) the crew and passengers are medically inspected; (2) the soiled linen and personal effects of the passengers which appear to be contaminated are disinfected; (3) the health of the crew and passengers watched for ten days from date of arrival, and the crew only allowed to land on duty. Vessels using Aden merely as a port of call generally remain in quarantine, as the medical examination causes delay. Very few cases of plague have been landed at Aden since this disease has been epidemic in Bombay, and in no case has any person at Aden been infected by such arrival.

Plague has shown very little tendency to spread on board ship. Of twelve ships on which the disease occurred, in five there was only one case, in five (one of which was crowded with pilgrims) there were two cases, in one three cases, and in one, crowded with coolies, there were eight cases. In two other ships in which infected rats were found, there were one and four cases respectively.

The rôle played by rats in the spread of plague.—That infection of rats is very frequently associated with the epidemic occurrence of plague, is now a matter of common knowledge, and the evidence laid before the Commissioners abundantly substantiates this view. But this has by no means been invariable, and it may be useful to look at the experience of other places where plague has been epidemic as well as that of India. In the great epidemics of earlier times there is little mention of this association. For accurate knowledge on this subject we are chiefly indebted to a painstaking historical research by Dr. Rudolf Abel.[1] Leaving on one side the often-quoted plague epidemic among the Philistines recorded in the Bible, as here there is no causal relation whatever described between mice and plague, he finds the first distinct reference in the writings of Avicenna (A.D. 1000), which, because of its remarkable similarity to the accounts given of the appearance of rats during the present epidemic prevalence, is worth quoting: "Et de eis quæ significant illud (the coming of plague) est ut videas mures et animalia quæ habitant sub terra fugere ad superficiam terræ et pati *sedar*, i.e. commoveri hinc inde sicut animalia ebria." Avicenna lived in Persia, and it is possible that his observations referred to Asiatic epidemics. Applying a rigid criticism to statements of later authors, who only speak of rats and mice among many other animals that they remarked appearing in plague-infected quarters, Abel considers that only in two of these—namely, in connection with an epidemic at Constantinople in 1348, and one at Moscow in 1771—is there a clear relation expressed between death of rats and plague. However this may be, it seems certain that had rats then been affected to the extent that they are now, the fact would have been recorded.

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[1] *Ztschr. f. Hyg.*, Leipzig, Bd. xxxvi.

At Oporto,[1] though rat infection was observed, it does not seem to have played an important part. The same is true of the epidemic in Alexandria.[2] In Glasgow in 1899 no infected rats were seen at all, while at Sydney the epidemic spread was chiefly referred to this cause. At Jeddah[3] in 1898 there were thirty-five cases and thirty-two deaths. The epidemic lasted only twenty-seven days; and though many mice infected with plague were seen crawling about the streets, the disease did not spread. Next year plague returned, causing one hundred deaths in two months; and *after* the epidemic had ceased high plague mortality among rats and mice continued.[4] Yersin[5] describes an epidemic in Annam of seventy-two cases from 15th June to end of October. He did not find any dead rats till the month of August, and though a reward was offered for them very few were got.

In the evidence laid before the Commission many similar cases are recorded. In Khandraoni, Ahmedabad, Rohri, in the first epidemic at Belgaum, in Hubli during the severe epidemic of 1898, and in Poona up to March 1899, dead rats were either not seen at all or only in very small numbers. Major Reade, I.M.S., speaking of the influence of rat infection from his great experience at Poona, extending from February 1897 to the time of giving evidence in March 1899, says; "As a source of infection it is one I have little knowledge of up to the present date, but from our recent experience in Poona I incline to believe that the influence of this infection has been much exaggerated."

A knowledge of the mode in which rats become infected is of great importance. The Commissioners think that infection through the alimentary canal cannot be common. The experimental work done by Gibson, Hankin, and Simond has all led to negative results. They state, "The details of Dr. Gibson's series of experiments are of great interest. He prepared the ten rats he used for the experiments by keeping them without food for twenty-four hours. He then fed them on small bundles of corn wrapped in pieces of gunny bags and then soaked in a broth cultivation of plague, which was found to be sufficiently virulent to kill in thirty-six hours when inoculated hypodermically into rats in a dose of 1 c.c. The bundles of corn which were supplied to the rats that formed the subject of feeding experiments, were given to them in a moist condition. The supply of infected food was renewed as required for about a fortnight. At the end of that time the rats, though each had consumed from 100 to 150 c.c. of the original plague culture, all remained well. Subsequently, with a view to testing their resistance, they each received hypodermically 1 c.c. of the plague culture in question, with the result that they all succumbed to plague within thirty-six hours." As to inoculation through the skin, their results differ somewhat from those of the German and Austrian Plague Commissions, and are thus stated: "We ourselves (and we were dealing with cultures freshly isolated from fatal cases of plague) found that it was in all cases necessary to inoculate a very sensible quantity of plague culture in order to ensure the death of the animal, and in some cases we found evidence of great resisting powers on the part of the rats with which we had to deal in Bombay." They also state "that the data which are available with regard to post-mortem appearances in rats do not permit of a final judgment being arrived at as to whether the system is generally invaded in a state of nature by the skin." As regards infection by the mucous membrane of the nose, they state "that of all channels of infection this seems to us to be most likely in such cases, for instance, as those where an outbreak of plague among rats appears to have been traceable to an importation of plague-infected clothing."

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[1] *Ann. de l'Inst. Pasteur*, Paris, tome xiii.; *Arb. a. d. k. Gsndhtsamte*, Berlin, Bd. xvii.

[2] *Ztschr. f. Hyg.*, Leipzig, Bd. xxxv.

[3] *Ann. de l'Inst. Pasteur*, Paris, tome xii.

[4] *Ztschr. f. Hyg.*, Leipzig, Bd. xxx. S. 481.

[5] *Ann. de l'Inst. Pasteur*, Paris, tome xiii.

In the case of plague, as in that of some other diseases, the spread of infection from sick to healthy has been attributed to the agency of suctorial insects. This view has been strongly urged by Dr. P. L. Simond,[1] both from the epidemiological and experimental side. From a study chiefly of the statistics of the principal epidemics in India up to August 1898, he concludes that there is little doubt of the preponderating influence of rats in the spread of plague; and, further, that in this influence can be explained nearly all the anomalies met with in its epidemic prevalence. His simple etiology leads to equally simple preventive measures! "The mechanism of the propagation of plague includes the transport of the virus by the rat and by man; its transmission from rat to rat, from man to man, from man to rat, and from rat to man, is due to parasites. The preventive measures ought therefore to be directed methodically against each of these factors—parasites, man, and rats." This paper has been discussed at some length in the Report. We have seen that epidemics among rats and among men are by no means always associated. Simond states that the interval between the introduction of plague into a place by human agency and its epidemic appearance is from twenty to fifty days, and that this period of latency is the period necessary for the development of the disease among rats. He cites three instances in support of this view, but only in one of them is there any mention in the evidence of plague among rats; in one, indeed, the statement is made that it did not occur. The paper contains two maps of the Bombay Presidency, stating for each place the time of first imported and of first indigenous case; and Dr. Simond tacitly assumes that a plague of rats took place in the interval, without adducing any proof. The Commissioners remark: "We may conclude that the dates set down in Dr. Simond's maps to establish that a prolonged period intervenes between the importation of the infection which originates an epidemic and the resulting outbreak of plague are, considered as evidence of the truth of that theory, entirely fallacious."

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[1] "La propagation de la peste," *Ann. de l'Inst. Pasteur*, Paris, tome xii.

The amount of experimental work adduced in support of his views is meagre. "A plague rat found dead in the city of Karachi and divested of its parasites" was placed in a cage containing seven healthy rats, and none of them died. This, so far as it goes, evidently only shows that a rat ceases to be infectious *an unknown time after death*, and cannot be used to prove that this non-infectiousness is due to the abandonment of its parasites. In another experiment three mice were inoculated with a fluid obtained by triturating fleas from plague rats in a few drops of water. All died, but the plague bacillus was only found in one of them. This, so far as it goes, only shows that fleas from plague rats have plague bacilli in them or on them, but does not show how such could be transferred to other animals. He admits that "we know nothing about the modifications suffered by a microbe in the body of a parasite. Is the virulence augmented, conserved, or diminished? How long does it continue?" The Commissioners quote in this connection Dr. Nuttal's experiments on bugs[1] (which Dr. Simond thinks may play a part in conveying infection to man). "Twenty-two bugs, which had sucked the blood of a mouse dying of plague (the blood contained many bacilli) were immediately placed on four mice. None of the mice sickened after being bitten by the infected bugs." Dr. Simond suggests that the transference of the bacillus by the infected flea to a new host is probably effected by the deposit of its dejecta in the flea-bites. The Report states: "No experiments on this question are to hand, but . . . the careful experiments of Dr. Nuttall in the parallel case of bugs have demonstrated that plague bacilli, when taken into the body of these insects, are in process of time destroyed." In proof that plague can be transferred by the agency of fleas, four experiments were performed. A rat dying of plague was placed in a large glass vessel, and in this was also placed an iron cage (with only one side sparred) containing a healthy animal, in three cases a rat, and in one case a mouse. To ensure an opportunity for the transference of plague to the healthy animal, some fleas from a cat were also put into the vessel. One mouse and one rat contracted plague; the other two remained healthy. There is no statement as to the precautions taken to prevent direct contamination of the cage by the discharges from the dying animal, or whether it had been proved that fleas parasitic to cats will transfer themselves to rats. Hence, whether the infection was really conveyed by these parasites is undetermined. Dr. Simond says: "We have studied the infection of animals by fleas as far as our installation would permit, situated as it was in a tent during the rainy season in India," and admits that the results are incomplete. This is quite evident. The results seem quite inadequate to support his view, "that this parasite (the flea) is the principal instrument of the contagion of plague under natural conditions."

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[1] *Johns Hopkins Hosp. Rep.*, Baltimore, Oct. 1899.

From the standpoint of our present knowledge, it is, however, impossible to deny that some suctorial insects may, to some extent, and in certain conditions, contribute to the spread of plague. This agency has been noted by Yersin and others of the French school. In India the excessive plague incidence among the Jains, a caste having a great objection to the destruction of any form of animal life, has been attributed to this cause. The epidemic outbreak at Sydney,[1] as has been stated, is attributed to plague-infected rats; and Dr. Ashburton Thompson, in his admirable report of that outbreak, seems distinctly to favour the idea that the agency of fleas was here operative in carrying the infection. But, on the other hand, the experience of the plague hospitals in India indicates that this agency is not an important one. Dr. Chosky points out that "the staff and attendants in the great Arthur Road Plague Hospital were continually bitten by insects, especially by mosquitoes, and that, none the less, no cases of the transfer of infection from the sick to the healthy came under observation."

Spread of plague in infected places.—The causes concerned are—(1) human agency, including infected clothes or merchandise carried about by man; and (2) rats. In estimating the relative importance of these, the Commissioners state:—

"1. In some places where severe epidemics have occurred among men, rats have not been infected at all; and in many places where there have been plague epidemics among men, the disease has not appeared among rats in epidemic form.

"2. Occasionally, where there has been considerable mortality among rats, there has been an absence of plague among men.

"3. Even when there has been the largest amount of plague among rats, the risk to the persons coming in contact with them appears not to have approached that undergone by persons inhabiting houses in which there have been plague patients, or persons coming into contact with pneumonic plague; there are, however, cases where a very considerable number of plague cases in a village has been directly attributable . . . to an epidemic among rats.

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[1] "Report on the Outbreak of Plague at Sydney," 1900.

"4. . . . Seeing that the excreta of rats may be deposited anywhere through a house, and that the number of rats which are infected may many times exceed the number of men who are infected, a severe epidemic among rats must, we think, tend considerably to the spread of infection.

"6. When plague is once established in a place, we have no doubt that human agency is a more important factor in spreading the disease than the agency of rats."

Influence of meteorological conditions.—If the weekly or monthly deaths from plague for all India during the period under consideration be plotted out, a curve is obtained showing a maximum in October and November with a fall in December, and a second maximum in March and April followed by an absolute minimum in June. But if such a curve be made for separate districts, *e.g.* Bombay city, Karachi, or Poona, the period of maximum and minimum incidence in each differs from the other, and all differ from the general curve for India; while, indeed, in the same place, the curve may differ in different years. Such curves cannot be brought into any relation with the curves for atmospheric temperature and moisture, or of rainfall.

Plague has been epidemic both in hot and cold weather. In Karachi and Cutch Mandvi it has been concurrently prevalent during periods when the mean daily temperature was not very dissimilar, but when the moisture in the atmosphere differed greatly. In Poona it was epidemic in 1897 and 1899; in the one case when the evaporating power of the atmosphere was great, and in the other when it was small. In Karachi and Cutch Mandvi where the rainfall is small; and in Bombay, Belgaum, and the district of Satara where the rainfall is three to four times greater, epidemics have occurred. In Poona in 1899, when the rainfall up to the end of September was only one-half of the normal for that period, it was exceptionally severe. No further light is given when these meteorological factors are viewed in connection with their effects on the physical condition of the soil. It has been epidemic on the dry permeable soil of Sind, where the rainfall is 5 to 10 in., and on the slightly permeable clayey soils of Satara and Dharwar with a rainfall of above 40 in.

Since an "acclimatisation theory" has been advanced by certain members of the Commission to explain the seasonal incidence of plague, its seeming preference for certain localities, etc., it may be well for purposes of contrast, before considering this theory, to look shortly at the views propounded by Pettenkofer to account for the endemic existence and epidemic occurrence of cholera in India. To begin with, it is to be noted that the close relation which the great German epidemiologist showed to subsist between cholera incidence, both in the endemic and epidemic areas of India, and the condition of the soil as regards moisture, has no analogue in the epidemiology of plague. According to Pettenkofer, cholera cannot spread in a district unless there exist certain conditions of the soil, namely, (1) permeability and organic pollution (*oertliche Disposition*), and (2) temperature and moisture (*zeitliche Disposition*). Given permeability of the soil in an inhabited locality of India, its pollution may be taken as a constant, the variable being its temperature and moisture condition; and it is only when this latter is favourable that we have that *oertliche-zeitliche Disposition* of a locality without which, according to this view, cholera cannot be epidemic. In his great work[1] he clearly states and logically enforces his views based on cholera prevalence, not only in India, but also in Europe. These are shortly as follows:—For the epidemic occurrence of cholera there must be (1) the specific cholera micro-organism, which can be carried from one locality to another both by the sick and the healthy; and this he calls *X*. (2) The sum of the *oertliche* and *zeitliche*, partly known and partly unknown conditions, which are necessary either for such increase in the number of these specific micro-organisms, or such increase in their virulence, as will make them capable of producing cholera; and this he calls *Y*.

The rainfall is the only available measure of the moisture of the soil in India, and subsequent work has shown that it is a valuable one. In the work done by Lewis and Cunningham[2] in Calcutta, we have an experimental inquiry into the condition of the soil there during the time of maximum and minimum cholera prevalence. Pettenkofer had first shown that the best measure of the biological activity of a soil is the amount of carbonic acid contained in the ground air. Lewis and Cunningham found (1) that the time of maximum cholera prevalence coincided with the time of minimum amount of carbonic acid in the ground air at a depth of 3 ft. and 6 ft.; (2) that the increased amount of carbonic acid in the ground air during the rainy season was not due to increased production, but to an interference with the escape of the ground air into the atmosphere; (3) that, therefore, the time of maximum cholera prevalence was, speaking generally, coincident with the time of maximum soil ventilation. The amount of carbonic acid in the ground air varies from place to place, and may be taken, speaking broadly, as a measure of the local soil pollution. In the Calcutta experiments it was distinctly small, the maximum being 12 c.c. per litre, whereas in the Buda Pesth and in the Edinburgh investigations it was between 20 and 30 c.c. per litre.

An interesting series of experiments was made in Bombay during 1900, at the Plague Research Laboratory, and published among its reports. The experiments were conducted in empty dwelling-rooms and their immediate surroundings in one of the most insanitary quarters of Bombay. The tubes by which the ground air was aspirated were sunk to a depth of 3 ft. The following results, derived from the amounts found in the daily experiments, are expressed in round numbers as c.c. of carbonic acid per litre:—

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[1] "Z. gegenwärtigen Stand der Cholera Frage."

[2] "The Soil in its relation to Disease," 1875.

	Feb.	March.	April.	May.	June.	July.	Aug.
Stone floor with open joints .	10	10	11	12	8	8	6
Stone floor set in cement .	4	3	...	...	...	...	...
Earth and cow-dung floor .	...	...	9	7	5	...	...
Verandah in front of a chawl .	55	...	...	...	...	...	...
Street in a filthy condition .	...	...	90	82	...	...	...
Ground at Government House	...	...	7	7	11	36	...

From the above it is seen that in unoccupied rooms the amount of carbonic acid in the ground air under a room with a cow-dunged floor is not by any means excessive as compared with that of other rooms, but that in the soil immediately outside of these dwellings the amount may be from 5 per cent. to 9 per cent. The results from Government House show the effects of rainfall in increasing the amount of carbonic acid, and agree with the Calcutta results above referred to.

The ground air may rise into the atmosphere in certain circumstances, by far the most important of which occurs when the atmospheric temperature is lower than that of the soil, at say 5 or 6 ft. deep. Under these conditions the ground air, pressed on by the colder and therefore heavier atmospheric air, escapes into the atmosphere at places of least resistance. Such diminished resistance is found in the earth-floored houses of the natives of India in the cold season, especially during the night; for then the outside air is coldest and heaviest, and the air in the houses is warmest and lightest. In the months of maximum plague incidence in Bombay, with a soil temperature at 5 ft. of 85° F., and a minimum atmospheric temperature of 65° to 70° F., the conditions are favourable for the escape into the houses of such very impure air as the above experiments show the soil in their immediate surroundings may contain. The experiments conducted by Dr. Marsh at the Bombay laboratory are interesting in this connection. He found that in tubes containing agar cultures of the plague bacillus, buried at a depth of about 1 ft., either in the floor of a native house or in garden mould in the open, both the growth and virulence of the bacillus were increased; and also that cultures of the organism, when grown in an artificial atmosphere containing 3 per cent. carbonic acid, grew particularly well. Of course such an amount of carbonic acid could hardly be present in the air of an *occupied* room even in India; still the experiments show that this gas has a favourable influence on the growth and virulence of the plague bacillus.

The acclimatisation theory.—The slow rate at which plague has spread has been attributed by some to the time required for a preliminary process of acclimatisation to the local conditions. Major Anderson advanced this view as a result of his general observation. He stated that "the disease, when it first appeared, was undoubtedly a coast disease, and required a high subsoil water for its development"; and considered that, since the disease had spread about in the interior, it more easily secures a hold on new places, provided these be situated within a certain tract of country. According to this observer, the risk of infection from an imported case was associated not so much with the fact of the patient suffering from an eminently infectious form of plague or not, as with the fact of his coming from a locality where the conditions were similar to those of the place into which he introduced the infection. There were no satisfactory examples cited in support of this view. The Report quotes, as bearing on this point, the failure of plague to spread far into the interior of Hyderabad from Sholapur; and also the fact that, though numbers of residents in Rajputana fled to their homes during the epidemic in Bombay, only one small outbreak of plague occurred in the territory. The first instance has already been accounted for quite irrespective of any theory; and in Rajputana the drastic measures on the railway for stopping plague cases entering the territory, readily affords an explanation. The instances given in the Report of plague epidemics breaking out immediately after the arrival of an imported case from a distant part of the country, *e.g.* from Bombay or Poona, are much more telling, and show clearly that no preliminary adaptation of the bacillus was required.

Bacteriological support for this theory is sought in the work of Danyz.[1] Working on a species of *Bacillus coli* only virulent for rats when injected hypodermically, Danyz claims to have been able—by purely bacteriological methods—to confer on it the power of virulence when given to the animal in food. He recommended the use of this organism for killing rats as a preventive measure against plague; but it should be mentioned that in the hands of very competent observers the method has failed. But even though Danyz has succeeded, it is very difficult to see how "the principle underlying the procedure adopted by him would appear to have a very great epidemiological importance," and "in particular in connection with the epidemiology of plague." Danyz worked with carefully determined conditions in order to produce this change. But what are the external conditions relied on to produce this acclimatisation of the bacillus of plague?

An illustration of the adaptation of this theory may be given from the Report:—"The fact that the epidemic which occurs in the latter part of the cold weather dies out in the altered meteorological conditions which are associated with the advent of the very hot weather or of the rains, suggests that a plague bacillus which is adapted for surviving in a particular external environment under the conditions of cold weather is not adapted for surviving under those of the extreme hot weather or the rains." The secondary maximum during the rains and the later decline "suggests that a plague bacillus can indeed adapt itself to the external conditions which obtain in the rains, but cannot" do so "without forfeiting the power of flourishing outside the organism in the external conditions associated with the cold weather." One may here be permitted the reflection, that the plague bacillus must be most adaptable. If the bacillus be on the surface of the soil, how can it withstand the high temperature and want of moisture during the hot, dry weather; and if it be in the lower layers of the soils, how does it pass from them to enable it to infect man? During the hot season, and previous to the rains, the temperature of the surface soil is very high. Buist found that a thermometer laid on the surface soil in India registered 71° C., and the dust storms in India show how dry the surface soil becomes in these conditions.

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[1] *Ann. de l'Inst. Pasteur*, Paris, tome xiii.

At the end of the paragraphs on this theory it is stated that "the President is unable to agree with many of the suppositions and statements in this paragraph." He discusses it in the Appendix, containing the statement of his views as to the cause of the epidemic spread of plague, as follows:—"It is obvious that the occurrence and extension of plague are independent of climatic conditions. . . . The bacillus is killed in from five to ten minutes at a heat of 62° C. to 63° C., and in from one to two hours at 50° C.; and even the highest of these temperatures is considerably below that of the sun's rays in many parts of India. Its growth is greatly retarded when, even in a moist state, it is exposed to sunlight." "In those parts of India in which plague has been prevalent, the plague bacillus, except in narrow lanes and overshadowed courtyards, such as are numerous in Calcutta, would be unable to maintain its existence for more than a brief period on the surface, or at a short distance below the surface of the ground, in the open air, and could do so only where it is protected from the destructive influences of climate. This protection can be obtained in the interior of dwellings, and there also the warmth requisite for the active vitality of the bacillus is secured when the temperature is either too high or too low (Kumaun) outside of the dwellings, and the requisite moisture is provided when in the outside air the bacillus would be killed by desiccation." "There appears to be no satisfactory explanation of those regular and exceptional incidents in the history of the plague epidemic other than that the predominating factor in the extension of the disease is to be found in the conditions which exist within and not outside the houses."[1]

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[1] Parkes, "Practical Hygiene," 6th Edition.

Influence of insanitary conditions on the extension and virulence of plague in India.—The evidence laid before the Commission shows that both in the urban and rural districts of India and among the great mass of the native population, there is almost a total neglect of the most elementary conditions of healthy living, both in the dwelling and its surroundings. As to the influence which these conditions have exerted on the spread of plague in India, the Commissioners are not unanimous.

The majority Report contains the following:—"We have been unable to find anything in the nature of statistical evidence, or in the nature of inference from scientific observations, to establish the proposition that any of the sanitary defects referred to or any combination of them exercises any marked favouring influence on the spread of plague." It also states that the opinion that plague occurs most frequently in dark, ill-ventilated, and overcrowded houses, and the opinion that it breaks out wherever the infection is carried, whether the sanitary conditions be bad or good, may be harmonised by assuming "that the factor which more than any other is likely to determine the introduction and spread of plague in a house, is the crowding together of a number of inhabitants in that house." So far as one can understand the meaning of this part of the Report, it seems that overcrowding is only harmful in increasing possibility of contact. But we have seen from hospital experience that close contact of relatives with patients in well-ventilated buildings does not spread plague. Again, overcrowding necessarily involves pollution of the atmosphere of the dwelling, and the extent to which it exists in India involves pollution of the grossest kind. It seems impossible to differentiate between the effects of these related conditions.

The Memorandum by the President on the effect of insanitary conditions.—This Memorandum has been prepared with the view of examining "the evidence bearing on the subject, for the purpose of determining to what extent the progress and virulence of the present Indian epidemic have been influenced by the existing conditions of sanitation; and, if they appear to have been injuriously affected, with the view also of ascertaining in what directions improvement is mainly suggested, and to what extent and by what means it may be effected."

A few examples of the insanitary conditions that obtain may be given:—

Calcutta.—As a sample of some of the houses, we have a house of twelve rooms described, and only two of these have any means of ventilation besides the door. It was occupied by 150 persons, though at the outside there was only room for fifty.

Bombay.—A large number of the inhabitants live in chawls, and the following description is given as an average example: "On the ground floor is a narrow central passage, about three feet wide and with a mud floor, running the entire length of the building. At one end of this passage is the opening into the street, and at the other is a latrine. . . . From this central passage doors open on each side into small cubicles with mud floors. There is neither chimney, window light, nor ventilation, except what penetrates through the doorway from the dimly lighted passage. . . . So dark are they that it is impossible at midday to see a second person in the room. The cubicles are 10 ft. square and 8 or 10 ft. high. The number of persons who sleep in them is limited by the floor space, for on a rainy night they lie like sardines in a tin." The chawl consists of five such storeys, connected by a narrow staircase.

Dharwar District.—Here the inner rooms of all the houses are absolutely dark, so that you cannot see your way. The Commissioner stated, in evidence: "When the first cases occurred here, I went into a house and fell over a dead body, and, getting a light, discovered another. There was no window, no light, and no ventilation."

Kumaun and Garhwal.—Here plague is regarded as endemic; and the same conditions as to darkness, want of ventilation, etc., prevail.

Sewage pollution of the soil is very general, and, as a rule, very gross. But while this is so, the evidence of the plague officials points almost entirely to the conditions inside the dwellings as the great cause of the spread of plague. These conditions are, especially, insufficiency of light and ventilation, overcrowding, dampness, a polluted atmosphere, and, to a less extent, uncleanliness.

It has been observed that fewer cases occur on the top storeys in chawls than on the ground floor. In Bombay, in seven wards of the city, the plague case mortality in the chawls diminished from the ground floor to the top storey. The ground floors were, of course, least ventilated. In a plague district the well-ventilated houses often escape. In Bombay, Karachi, and Poona no cases occurred in such houses, even though dead rats were found in them. Cases sometimes occur in houses well provided with the means of healthy living, but where these means have not been taken advantage of. The jailer's house in Satara was an example. "It was an ideally perfect house, even for Europeans to live in; but he only used one room of it, 12 ft. by 14 ft., and in this three adults and six children slept. They all slept on the floor, and kept all the doors and windows shut. There was plague in this house two years in succession. The jail, which is next door, remained free from plague, even though there were plague rats in it; and when a plague case was introduced into it there were no further cases, because ventilation is enforced among the prisoners."

Plague has sometimes attacked sparsely-inhabited districts with great severity. This was seen in the suburbs of Bombay. Lieut.-Colonel Weir pointed out "that the houses there were old-fashioned, with a number of inner rooms not communicating directly with the outside air, very ill ventilated, dark, and damp, and in these the people generally slept." Here we have another proof that density of population is by no means correlative with overcrowding in dwellings. The immunity of Europeans, which is attributed to their better ventilated houses, does not extend to their native servants, who live in the same compound, but in houses or huts quite separate from their master's. These are frequently much overcrowded. In the Marine Lines at Bombay the plague incidence in the servants' quarters was very high, while in the adjoining bungalows, in many instances connected with the servants' quarters by covered ways, the incidence was insignificant. Very few of these servants' houses had a window. Parsees, who live, as a rule, without overcrowding, have an immunity from plague nearly as great as that of Europeans.

But perhaps the most striking proofs of the effects of overcrowding on plague spread are found in the course of events in properly and improperly supervised evacuation camps, and in the results of complete evacuation. The experience in contact camps has already been discussed. There are numerous instances recorded in the evidence where the removal to an evacuation camp of the inhabitants of a town or village in which plague had been extending, often with great rapidity and virulence, was almost immediately followed by a decided diminution or total cessation of further cases. Change of site does not explain this. The introduction of a person suffering from plague into a native dwelling in which there had been no previous cases has frequently caused infection to the healthy inmates; while, as we have seen, cases occurring in properly ventilated evacuation huts have hardly ever infected others. The experience in hospitals, where good ventilation exists, and on board ship, where, even in the coolie and pilgrim ships, there are regulations enforced for preventing overcrowding, has already been discussed.

The President does not regard plague as a filth disease in the ordinary acceptation of the term. He considers that the influence of filthy conditions is a secondary one. While there is much indirect evidence that plague bacilli continue to exist for long periods of time in filth, there is no direct bacteriological proof of this. The failure to detect the bacilli in cow-dung floors, etc., is probably due to the absence of any method of separating them from the saprophytic organisms found there. But the vitality of the organism is lessened and even destroyed by exposure to air and light. The scavengers and sweepers of Bombay, who lived in well-lighted and ventilated municipal chawls, suffered very little from plague, even though their chawls were situated in plague-infected districts; while among those living in the ordinary native houses there were many cases. Filth, either inside or in close proximity to dwellings, has, however, a detrimental influence in increasing the vitiation of the atmosphere, and possibly by supplying nutriment for the bacillus. It thus adds to the conditions within the dwellings that are favourable to the vitality and virulence of the bacillus, and unfavourable to the health or powers of resistance of the occupants.

The views of the President on the effects of overcrowding and bad ventilation may be expressed as follows:—

1. The extension of the disease and its great fatality are largely dependent on the vitiation of the air in the dwellings.
2. The cause of this vitiation is not only uncleanliness, but the absence or insufficiency of means of ventilation, and overcrowding.
3. That the overcrowding is chiefly operative by adding to the air pollution.
4. The increase of moisture and the elevation of temperature, the increase of carbonic acid and the diminution in the amount of oxygen in the atmosphere, together with the deficiency of light, stimulate the growth and increase the virulence of any plague bacilli that may be present, and at the same time predispose the occupants to attack by plague.

After discussing the important part taken by rats in spreading plague, he summarises his views on the whole subject:—Plague is an infectious disease, fostered chiefly—(*a*) by insanitary conditions, the most important of which is air pollution within dwellings, and (*b*) by rats. If both (*a*) and (*b*) be present, the suppression of a widespread epidemic is practically impossible unless complete evacuation of every infected place be carried out. If there be no considerable number of rats, the suppression is less difficult. If there be no gross air pollution within dwellings, the suppression is not specially difficult, as the chief agency in enhancing infectivity and virulence would be absent, and rat infection would cease to be an important factor in the spread of the disease.

The preventive measures recommended by the President are simple, and follow naturally from his views as to spread of the disease. The minimum requirements for dwellings are—(1) Each room should be provided with a window for the admission of air and light. (2) Each house and its immediate surroundings should be kept reasonably free from all causes of air pollution. But while the former measure may be carried out at small expense, the latter involves great outlay. If, however, carried out, and a new sanitary organisation for India be formed, as recommended in the Report and in this Appendix, the hopeful view of the

President, expressed at the conclusion of this Memorandum, will be shared by most. "If, by the several means that have been indicated, the activity in sanitary reform which has been created by the present epidemic of plague should be maintained and developed, India will ultimately be more than recompensed for the great sacrifice of life and the hardships and pecuniary losses which are being caused by the pestilence."

Two views of the etiology of plague have been presented by the Commissioners. The one just considered seems to the writer more defined, more consistent with the observed facts as set forth in evidence, and more in harmony with the results of scientific experiment. It has long been known in a general way that plague is fostered by insanitary conditions; but here we have, for the first time, a demonstration that it is the conditions inside the dwelling that chiefly operate in the epidemic spread of that disease.

The discussion of this Report has extended further than was originally intended, and no room is left for discussing disinfection of dwellings. This, however, is less to be regretted, as the conditions as to structure of native houses in India made it almost impossible—however careful and skilled the operator, and however efficient the germicide—to secure efficient disinfection. Disinfection, when applicable, is of course a very important measure, but it seems to have played a small part in this sense in India.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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The Life of Pasteur. By René Vallery-Radot. Translated from the French by Mrs. R. L. Devonshire. Two vols. Westminster: Archibald Constable & Co. Ltd. 1902.

Louis Pasteur will live in the records of his works, where and so long as scientific medicine holds a place. For those who know the man only through his work, there is a special fascination in an account of his home life, and in any description of his personality. His researches appeal so strongly not only to the imagination and the intellect, but also to our sense of humanity, that it is extremely interesting to have his life from the pen of a literateur who, through family connections, had unrivalled opportunities of seeing the great man in all sorts of circumstances and conditions. M. Vallery-Radot presents a picture that appeals to us as being a most life-like and interesting portrait. It is certain that in years to come successive generations of scientific investigators will feel that they know Pasteur and his work better, because of the happy chance that led to the record of his life being made by his son-in-law, M. Vallery-Radot. They will certainly owe a debt of gratitude not only for a record of an interesting life, but also for one that should be a stimulus to the mind of every one engaged in the cult of scientific medicine.

Louis Pasteur (and, by the way, why is the name printed Henri under the excellent photogravure that faces the title-page of the first volume?) was essentially the product of the sturdy tillers of the soil, who did so much to make the name of the first Napoleon worshipped in France and feared by the rest of Europe. His father, Jean Joseph Pasteur, a tanner by trade, was drawn as a conscript in 1811, and went through the Peninsular War in 1812, 1813. He was one of the 8000 men which formed the Leval division that fought at Bar-sur-Aube against an army of 40,000, and one of the 3rd Regiment spoken of as "brave amongst the brave," of which Thiers writes in his "History of the Consulate and the Empire," that "if Napoleon had none but such soldiers the result of that great struggle would certainly have been different." In 1814 this conscript soldier was made a sergeant-major, and received the cross of the Legion of Honour. He retired from the army a couple of months later, when, on the fall of the Emperor, his regiment received the name of the Régiment Dauphin. The following year, at the age of 26, having commenced work as a tanner, he married Jeanne Etiennette Roqui, and emigrated to Dôle, there settling down in the Rue des Tanneurs.

Louis Pasteur was born Friday, December 27, 1822. He was one of a family of four; he had three sisters, one older and two younger than himself. Jean Joseph Pasteur, though not considered a proud man, did not easily make friends. He never spoke of his campaigns and never entered a café. On Sundays, wearing a military-looking frock-coat, spotlessly clean and adorned with the ribbon of the Legion of Honour, he is described as taking his walks for solitary meditations, "dwelling more anxiously on the future than on present difficulties, the latter being of little account in this hard-working family." His friends were an old army doctor, then practising in the Arbois Hospital, Dr. Dumont, "a man who studied for the sake of learning," and Bousson de Mairet, a philosopher and an indefatigable reader, who spent his life in compiling from isolated facts annals in which the characteristics of the Francs-Comtois, and especially the Arboisians, were reproduced in detail. His father, who wished to instruct himself as well as to help his son, helped the boy with his home lessons, and appealed to his childish imagination with stories of local patriotism and of the conquests of the Empire, so dear to the French people. The boy's school life seems to have been what one would have expected under such conditions. His first appearance in the higher schools was somewhat unpromising, as, after entering at the Barbet School, and attending the classes of the Lycée St. Louis for a time, he became thoroughly homesick, and returned to Arbois to take up again his study of drawing, for which at that time he had a great liking. After a time his desire for knowledge again gained the upper hand, and his father decided to take the lad to the Royal College of Besançon, where, first as a student and then as a preparation master, Pasteur's ability, and still more his moral qualities, won the esteem alike of pupils and colleagues. When but eighteen he appears to have had the faculty of "moralising" extraordinarily strongly developed, and one cannot but be struck by the solidity and common sense that characterised his letters at the period when he returned to the Barbet Boarding School to prepare himself for admission to the examinations for the Ecole Normale. At the end of the school year he was admitted, fourth on the list, to the Ecole Normale. In 1843 we find his father writing: "Do you still attend M. Poulett's lectures, or do you find that one science hampers the other? I should think not; on the contrary, one should be a help to the other." What Pasteur's father suggested, Pasteur's work demonstrated in later years. From 1844 to 1849, Pasteur devoted himself to researches on crystals and their rotary power. On 29th May of the latter year Pasteur married Mdlle. Marie Laurent, daughter of the rector of the Academy of Strasburg—a happy union, with a wife who shared with her husband his joys, anxieties, and renewed hopes; and we are told that at this time, as throughout succeeding years, between domestic happiness and prospective researches Pasteur's life was complete. From 1850 to 1854, Pasteur continued his studies on crystals, and with a prize of 15,000 francs, awarded to him by the Pharmaceutical Society, he bought instruments which the Strasburg Laboratory was too poor to afford. In September 1854 he was made Professor and Dean of the new Faculté des Sciences at Lille, and his earlier studies, which had led up to his work on fermentations, were now utilised in the study of the local industries of that city, and he took up the study of lactic fermentation, describing the globules that set up this fermentation as being much smaller than those of yeast. Here, of course, he was able to utilise his earlier observations on alcoholic fermentation, and to carry to its extreme limits his dictum "that it is always a mistake not to doubt when facts do not compel you to affirm."

An interesting glimpse into the heart of the man is obtained in a letter which he wrote to his father on December 30, 1859. He had just lost his eldest daughter from typhoid fever at Arbois, where she was staying with her grandfather: "I cannot keep my thoughts from my poor little girl, so good, so happy in her little life, whom this fatal year now ending has taken away from us. She was growing to be such a companion to her mother and to me, to us all . . . But forgive me, dearest father, for recalling these sad memories. She is happy; let us think of those who remain, and try as much as lies in our power to keep from them the bitterness of this life." It appears to indicate more fully than whole volumes of description the spirit in which Pasteur approached his work, and may be commended to the careful perusal of those who view Pasteur as a kind of human fiend, whose delight it was, not to relieve pain and save life, but to inflict suffering and to kill. In a narrative of this kind the personal element is of far greater interest than the scientific, but only as affording some indication of the springs of action and thought of a great mind; and one cannot help feeling, as one reads record after record of Pasteur's work, of his earnest seeking after truth, of his determination to overcome difficulties, and to wrest nature's secrets from her in the cause of truth and humanity, that here we have something more then mere intellectual greatness: there is a moral force behind it all that compels attention and admiration for the man, whether he is working at the diseases and conditions that play such ravages with industries,—beer and wine diseases, the silkworm disease, the plague and anthrax,—or is dealing with the preventible diseases that are the cause of human suffering; whether he is probing and testing the theories of spontaneous generation or abiogenesis, or stating and defending them before his colleagues of the Academy of Sciences or the Academy of Medicine. Pasteur was in earnest, and modest as he was he always felt that upon his work and his efforts much depended, and that he could do something to help his fellow-creatures, and (with that patriotism that characterised his every thought and action), especially his compatriots, for he always had the thought in his mind that what benefited his fellow-creatures must redound to the credit of his beloved France. His personal ambition is never in evidence, and any ambition that may have been present is the noble ambition of a citizen of a great country, whose honour and glory it is his duty and privilege to maintain. Pasteur appears to look upon his investigations, especially those of less importance,—if to any of them may be applied such a term,—and such as he had been able to carry out unassisted, with simple apparatus and little accommodation, as a lever with which to move those in authority to supply better facilities and accommodation for work, and to endow workers with sufficient means for their support; for thus he believed France and her sons might contribute still more to the commonwealth of science. How far he was successful, the beautiful

Institute Pasteur, and the other laboratories scattered over Paris and France, to which modern medical science owes so great a debt, afford ample evidence. He says: "I implore you, take some interest in those sacred dwellings meaningly described as *laboratories*. Ask that they may be multiplied and completed. They are the temples of the future, of riches and of comfort. There humanity grows greater, better, stronger; there she can learn to read the works of nature, works of progress and universal harmony; while humanity's own works are too often those of barbarism, of fanaticism, and of destruction.

"Some nations have felt the wholesome breath of truth. Rich and large laboratories have been growing in Germany for the last thirty years, and many more are still being built; at Berlin and at Bonn two palaces, worth four million francs each, are being erected for chemical studies. St. Petersburg has spent three and a half million francs on a Physiological Institute; England, America, Austria, Bavaria have made most generous sacrifices. Italy, too, has made a start.

"And France?

"France has not yet begun" . . . He mentioned the sepulchre-like cellar where the great physiologist Claude Bernard was obliged to live. The laboratory of the Sorbonne was no better—a damp, dark room, 1 metre below the level of the street. He went on to demonstrate that the provincial faculties were as destitute as those of Paris. "Who will believe me when I affirm that the Budget of Public Instruction provides not a penny towards the progress of physical science in laboratories, that it is through a tolerated administrative fiction that some scientists, considered as professors, are permitted to draw from the public treasury, towards the expenses of their own work, some of the allowance made to them for teaching purposes?"

There is little wonder that Pasteur was adored by his colleagues, and they, with him, looked forward to the time when, with Napoleon, France might say: "Condemned now to command armies no longer, I can see but science with which to occupy my mind and my soul." He and they looked forward to a time when the scientific supremacy of France, manifested during the early part of the nineteenth century, should return in all its glory. Of that time he says: "All the other nations acknowledged our superiority, though each could take pride in some great men: Berzelius in Sweden, Davy in England, Volta in Italy, other eminent men in Germany and Switzerland; but in no country were they as numerous as in France." Further, Pasteur saw the remedy as well as the disease, as is evident from his regretful description of the cause of the scientific decadence of France at that time: "A victim of her political instability, France has done nothing to keep up, to propagate, and to develop the progress of science in our country; she has merely obeyed a given impulse; she has lived on her past, thinking herself great by the scientific discoveries to which she owed her material prosperity, but not perceiving that she was imprudently allowing the sources of those discoveries to become dry, whilst neighbouring nations, stimulated by her past example, were diverting for their own benefit the course of these springs, rendering them fruitful by their works, their efforts, and their sacrifices. Whilst Germany was multiplying her universities, establishing between them the most salutary emulation, bestowing honours and consideration on the masters and doctors, creating vast laboratories, amply supplied with the most perfect instruments, France, enervated by revolutions, ever vainly seeking for the best form of government, was giving but careless attention to her establishments for higher education . . . The cultivation of science, in its highest expression, is perhaps even more necessary to the moral condition than to the material prosperity of a nation." Has England, also, to relearn the lesson?

One sees how the citizen of the world was lost in the patriot, when Pasteur returned his diploma to Bonn University at the outbreak of the Franco-Prussian War. One cannot but feel that it would have been better that this should not have been done; but when one considers the character of the man, his patriotic ardour and moral earnestness, one thinks no less of him as a Frenchman for acting as he did.

Many will read with interest Pasteur's opinions of England and of Scotland, and Edinburgh men especially will value his warm eulogium of Edinburgh and the work done at their Alma Mater. He seems to have been greatly touched and delighted by the reception he received at the tercentenary celebration of the foundation of this University; and those who remember his powerful face, his genial, simple, and unaffected manner, feel that it was a great privilege to come into personal contact with such a man. At the medical congresses in London and in Copenhagen, and at his birthday celebrations in Paris, the grandeur and simplicity of the man were manifest at every turn. He was delighted and astonished at his reception. He was friendly to all who took any interest in his work, and nothing seems to have given him greater pleasure than to discuss even the most trifling details with the veriest tyro who was anxious to learn; but his patience with those who were ignorant was only equalled by his sorrow and indignation at the stubbornness of those who had no such desire. Many men have known Pasteur simply as a worker, but even those who turn to the present biography for an account of his work will find it is so interwoven with his life as a tender but strong human being, that they, along with the general reader, will rise with the feeling that they have here the presentment of a true man—a man whose example both in thought and in action is worthy of the fullest imitation.

The closing period of Pasteur's life appears to have been as happy as the days of his more strenuous labours. Surrounded by friends and relations whose one desire was to help him to do his work, to economise his strength, and to make his path easy, who were devoted to his every interest, he felt that, under the more favourable conditions offered to his young disciples, they might well carry on the work that he had begun; indeed, he lived long enough to realise how great an impression he had made upon those who were indebted to him for their training and for the stimulation of their enthusiasm. To MM. Duclaux, Metchnikoff, Roux, Grancher, Chantemesse, Chamberland, Calmette, Yersin, and a host of other able and indefatigable investigators, he was content to consign the work that he had outlined for completion. He was now satisfied, too, that the workers in other countries recognised the value of what he had done, and would continue to repeat his experiments and carry on investigations on independent lines. He therefore had the assurance that his life's work had not been in vain, and that not only France, but the whole civilised world, would look upon a son of France as a benefactor to the human race. The pathetic element usually associated with the end of a great life appears to have been non-existent. Pasteur was always hopeful, ever cheerful, and confident that his life's work would go on. There was no talk of the wearing out of his powers, only a confidence that those who were young and active were willing and able to devote themselves to the furtherance of what he had so deeply at heart. His family life was equally happy; and his biographer, in recording his death, mentions it merely as an incident, for Pasteur lives and must live so long as pain and disease remain as a heritage for the human race.

Of the work itself it is unnecessary to say much. To compare it with Boswell's "Life of Johnson" would be out of place, but to say that it reminds one of that great work is sufficient to indicate how M. Vallery-Radot has done his work. Now and again one would have been glad had the author not taken quite so much for granted. The general reader will know little of the corpuscles of the silkworm disease, but there is nothing to give him any information as to what they are and how they act before a description of the experiments on the silkworm disease are given. These corpuscles, of course, are very simple matters to the author and to most experts, but to the general reader they are not "understanded." The translation is exceedingly good, for the spirit of the author evidently runs through the written word of the translator. A few technical terms, however, remain in their French rather than in their English garb, whilst here and there a number of Gallicisms and French forms of ordinary English words may be found. One objects somewhat to the use of the word "vulgarising" instead of "popularising," though no doubt the translator would be able to defend successfully the use of this term.

Withal, the translator has done her work excellently, and we congratulate her on bringing this work within the reach of the English general reader. G. SIMS WOODHEAD.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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DIAGNOSIS, CLINICAL METHODS, Etc.

When a Trace of Albumin and a few Tube Casts in the Urine may offer some Advantages.

Osler (*N. Y. Med. Journ.*, November 23, 1901) illustrates the truth of the old adage, "'Tis an ill wind that blows nobody good," in the course of a brief paper upon this, at first sight, somewhat paradoxical subject. In the first place, the patients must be over 50 years of age, and in good general condition. In such, overstoking and driving the bodily powers through long years almost invariably "mean early degenerations; the waste-pipes—the kidneys—are often the first to show signs of ill-usage." Examinations for life assurance in these cases, and most frequently after applications for increase of the sums assured in former policies, very commonly constitute the primary cause of discovery of the condition at an early stage, before the ordinary state of general health has become appreciably altered.

To give an example: A distinguished public man in Canada, after a very active life, and lack of care as to habits of eating and drinking, was examined at the age of 60 for insurance. Albumin and tube casts were found in his urine, and grave apprehensions were engendered as to his future, both in the patient himself and in those connected with him. However, after about a year of rest, he recovered heart, set to work again, accomplished quite as much as he did during the previous twenty years; is now an octogenarian of exceptional vigour.

"Not dead yet!" were the words whispered into Osler's ear in Antwerp Cathedral last summer by a gentleman of 63 whom an insurance office rejected in 1891, when he was 53, for Bright's disease, and who consulted Osler soon afterwards. His urine during these ten years, though sometimes free from albumin, could always be made to yield a few tube casts on centrifugalisation. He also had a marked gouty history. At 63 he is strong and vigorous.

The fact is that "in men in the fifth and sixth decades albuminuria is by no means infrequent, and not always serious; it is often a renal inadequacy, not of vital importance; while neither the albumin nor the casts, whatever their number or variety, are so valuable for diagnosis and prognosis as other factors."

"The points on which one should lay special stress as indicative of serious disease are — (1) Persistent low specific gravity of the urine, 1·008 to 1·012. (2) The state of the heart and arteries. Marked sclerosis of the peripheral arteries, with the apex beat of the heart an inch or two outside the nipple line, and a ringing, highly accentuated aortic second sound. (3) The presence of albuminuric retinitis."

"I am much impressed by Aphorism 13 of George Cheyne's 'Essay on Regimen,' so well known to our grandfathers; it is worth quoting, as containing the one important element, I think, in the treatment of the condition of which I am speaking: 'Every *wise* man, after 50, ought to begin to lessen at least the *quantity* of his *aliment;* and if he would continue free of great and dangerous distempers, and preserve his *senses* and *faculties* clear to the *last*, he ought every seven years to go on abating gradually and sensibly, and at last *descend* out of life as he *ascended* into it, even into the child's diet.'"

TESTS FOR DIACETIC ACID IN THE URINE.

Arnold, *Wien. klin. Wchnschr.*, 1899, No. 20. *Idem, Centralbl. f. Innere Med.*, 1900, No. 17. Lipliawsky, *Deutsche med. Wchnschr.*, 1901, No. 10. Allard, *Berl. klin. Wchnschr.*, 1901, No. 39.

ARNOLD gives a new test for detecting diacetic acid in the urine. (1) A solution of para-amido-aceto-phenone, 1 grm. in 100 grms. of distilled water, dissolved by the addition of one or two drops of strong hydrochloride acid and shaking. (2) A 1 per cent. solution of sodium nitrite. Both solutions must be freshly prepared on the day of use. Two parts of No. 1 are mixed with one part of No. 2, thus forming para-di-azo-aceto-phenone; a portion of the urine, equal to the sum, added; followed by two or three drops of strong ammonia solution. The mixture becomes of a brown-red colour, a few drops of which, treated with excess of concentrated hydrochloric acid, develops a purple-violet tint if diacetic acid is present. Only ethyl-ester reacts similarly. If neither of these bodies be contained in the urine, the solution becomes pure yellow in colour, with no trace of red or violet.

In specimens with but traces of the acid or of highly concentrated character, decolorisation with animal charcoal beforehand is advantageous. Indeed, Arnold states that in no case where a comparatively distinct result was obtained from Legal's test was diacetic acid absent; suggesting that the occurrence of a pure acetonuria is improbable.

Extracts of urines obtained after alkalinising by treatment with alcohol and acetone-free ether may fail to give any of the reactions for acetone, while answering to the test for diacetic acid.

Lipliawsky has modified the foregoing test as follows:—The two solutions are unaltered, the procedure the same up to the addition of ammonia (definite quantities, however, are given: 6 c.c. of No. 1, 3 c.c. of No. 2, and 9 c.c. of urine); after vigorous shaking, ten drops up to 2 c.c., relative to the proportion of diacetic acid in the sample, and mixed with 15 to 20 c.c. of strong hydrochloric acid, 3 c.c. of chloroform, and 2 to 4 drops of a solution of perchloride of iron. The reagent-glass is then corked, gently rotated, avoiding emulsification of the chloroform; then, after half a minute to a minute, if diacetic acid be present, the layer of chloroform acquires a characteristic violet colour, which for weeks remains unaffected by the action of light.

Allard has investigated the relative delicacy of Gerhardt's (perchloride of iron reaction), Arnold's, and Lipliawsky's methods. He employed for this purpose artificial solutions of diacetic ether (diacetic acid itself decomposes with extraordinary readiness), and also urines containing the acid; the latter were especially tested with regard to the influence of degrees of concentration upon the efficacy of the reaction.

Author.	Reagent.	Limit of Reaction per mille of Urine.
Gerhardt (1865) . .	Perchloride of iron	0·4 –0·5 per 1000
Arnold (1899). . .	Para-di-azo-aceto-phenone	0·1 ,,
Lipliawsky (1900) .	*Idem*, with chloroform and perchloride of iron	0·04 ,,

Allard, however, supplies a few words of advice regarding the practical working of Lipliawsky's test; several points require more particular definition. His ammonia solution should read strong ammonia solution; his strong hydrochloric acid solution should read especially concentrated acid,—specific gravity 1·19,—for the official concentrated acid, with a specific gravity of 1·124, although sufficient for its purpose in Arnold's test, cannot be depended upon in his. Allard as well would continue the pronation and supination movements of the glass for at least three or four minutes before concluding that the acid must necessarily be absent.

Notwithstanding the greater delicacy of Arnold's and Lipliawsky's tests compared with Gerhardt's, the simplicity of the latter and the complexity of the first two will adduce to the continued general use of the simple method. Nor is it certain that the more delicate tests serve any good purpose; less diacetic acid in the urine than the amount that reacts to Gerhardt's test is possibly innocuous.

(In the *Skandin. Arch. f. Physiol.*, Bd. xi. S. 97, Geelmuyden discussés the question of acetone and allied bodies from a physiological standpoint in some detail.)

ACETONE.

THE various tests which have been devised for the detection of acetone in the urine are reviewed *seriatim* by Vervæke in *Arch. méd. belges*, Bruxelles, June 1901. The qualitative reactions referred to comprise—Lieben's: formation of iodoform at once after addition of a few drops of iodine and iodide of potassium solution *plus* liquor potassæ (alcohol and other bodies react similarly, but less quickly), its limit is as low as 0·005 *per mille* of urine; Gerhardt's: perchloride of iron giving a red colour not really due to acetone, but to diacetic acid (see above); Legal's:

nitro-prussiate of sodium, caustic soda, and acetic acid, with the production of a rose to red colour; Rimini: a bright red violet coloration is produced in acetone—containing urine on the addition of ethylenediamine and nitro-prussiate of sodium (a modification of this test, as proposed by Melkebeke, is too complicated for ordinary clinical use); Penzoldt's: a freshly prepared solution of ortho-nitro-benz-aldehyde forms with acetone, on rendering the mixture alkaline with potassium or sodium hydrate, a blue colour; the blue has been attributed to the formation of indigo by Bäyer, thus—

$$2C^6H^4(NO^2)CHO + 2C^3H^6O = C_{16}H_{10}N_2O_2 + 2C_2H_4O_2 + 2H_2O.$$

A few drops of chloroform added to the above rapidly acquire some of the pigment and become blue. Sensibility 1 per 1000. The two quantitative methods for acetone are somewhat too technical for detailed mention here. One is colorimetric, nitro-prussiate of sodium entering into the process; the second depends upon the titration of the iodoform, resulting from the action of iodo-iodide solution upon acetone, by means of a solution of nitrate of silver, after some intermediate manœuvres.

A new laboratory, not a clinical, test for acetone is published by Sternberg (*Centralbl. f. Physiol.*, Leipzig u. Wien, 1901, No. 3), based upon treatment of the distillate of the urine at issue with phosphoric acid, copper sulphate, and iodo-iodide of potassium; when the resulting solution is warmed, a light grey precipitate falls. Apparently the reaction is neither delicate nor valuable.

SURGERY.

UNDER THE CHARGE OF

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Surgical Experience of Cancer of the Stomach.

Von Mikulicz reported on the above to the Surgical Section of the Meeting of German Naturalists and Doctors recently held at Hamburg.

From April 1891 to March 1901, 458 cases of cancer of the stomach had been under observation in the clinique at Breslau. This number includes forty-six cases of cancer of the cardia. The diagnosis was confirmed either at the operation or by observation of the progress of the disease, or by examination after death. In several cases of cancer of the cardia the diagnosis was confirmed by œsophagoscopy or by the removal and examination of a small portion of the growth. In 128 cases no operation was performed, chiefly because radical removal was no longer possible, and because there was no indication for any palliative procedure, such as gastro-enterostomy. In exceptional cases the operative interference was declined by the patient. The total duration of life from the commencement of the disease (as inferred from the symptoms in

67 cases in which it was possible to ascertain the facts) varied from a few months to 38 months, an average of $11\frac{1}{5}$ months.

In 320 cases recourse was had to operation as follows :—

1. Simple exploratory incision, .	44
2. Gastrostomy (in cancer of cardia), .	27
3. Jejunostomy, . . .	12
4. Gastro-enterostomy, . .	143
5. Resection of stomach, . .	100
6. Extirpation of stomach, . .	3

1. *Exploratory incision.*—Four deaths followed this operation, giving a mortality of 9 per cent. The average duration of life after operation was $4\frac{8}{10}$ months, and from the beginning of the disease $14\frac{3}{10}$ months. If the cases submitted to exploratory laparotomy be added to those in which no operation was performed, we get *an average duration of life of a little over* 13 *months from the beginning of the disease*, a figure which is adopted by the author as a basis for judging of the results of the operative treatment of gastric cancer.

2. *Gastrostomy.*—There were four deaths in twenty-seven cases, giving a mortality of 15 per cent. The average duration of life after operation in those who recovered was $3\frac{1}{2}$ months, and from the beginning of the disease $11\frac{1}{10}$ months. These results are by no means encouraging, and the author is inclined to restrict this operation to those cases in which fluids can no longer reach the stomach, and where the patient suffers severely from hunger and thirst.

3. *Jejunostomy.*—There were seven deaths in twelve cases. The author is of opinion that this operation should be given up, and that when the stomach wall is found to be so extensively diseased that a gastro-enterostomy is impossible, the belly ought to be closed again.

4. *Gastro-enterostomy.*—There were forty-eight deaths in 143 cases, a mortality of $33\frac{1}{10}$ per cent. Although during the last three years the mortality has been reduced to $26\frac{1}{2}$ per cent., it is still very high in proportion to the same operation in non-cancerous conditions. The average duration of life after operation was $6\frac{4}{10}$ months, and from the beginning of the disease 14 months; but if the operation deaths are included, this is reduced to $12\frac{3}{10}$ months, or slightly shorter than the duration of life when no operation is performed.

5. *Resection of the stomach.*—There were thirty-seven deaths in 100 cases. In the last three years the death rate has been reduced to 25 per cent., that is to say, a mortality slightly lower than that of gastro-enterostomy. The results, as observed in fifty-eight patients who survived the operation, and whose subsequent history is known, are as follows: Twenty are still alive between six months and eight and a quarter years. Of these, seventeen are alive longer than one year, ten longer than two years, four longer than three and a half years; these last four may be regarded as radically cured. The author regards these results as quite as good as those after operations for cancer of the tongue or rectum.

Resection of the stomach has, further, an important sphere as a palliative operation on the same lines as gastro-enterostomy, which is preferred by the majority of surgeons. In the author's experience, resection of the stomach is not only attended with a less mortality than gastro-enterostomy, but with a greater prolongation of life, amounting to ten months. A third advantage of resection over gastro-enterostomy is the very much greater relief to the patient; the pain ceases, digestion takes place under normal conditions, the body weight increases rapidly, and the patient, for a time at any rate, feels perfectly well. The subsequent death, if due to secondary growths, is a comparatively easy one; whereas after gastro-enterostomy improvement is very temporary, and may not take place at all. In view of these facts, Mikulicz believes that *gastro-enterostomy is of very little value in cancer of the stomach*, and that it should be restricted to cases in which there is marked pyloric obstruction, and in which the cancer is localised to the pyloric region. Resection, on the other hand, should be practised more freely than has hitherto been the custom, without regard to the question of radical cure, provided its performance is feasible. In view of the impossibility of ascertaining the state of affairs before opening the belly, recourse should be had to exploratory laparotomy in all doubtful cases. If it is then found possible to resect the stomach, the small exploratory incision should be enlarged; if, on the other hand, resection is impossible, the belly should be closed again, unless there are clear indications for doing a gastro-enterostomy.

As regards the technique of resection, the author recommends a more radical operation than he formerly practised; the incisions being made well beyond the growth, both on the cardiac and duodenal aspects. The examination of the specimens removed showed that the disease in the stomach itself was completely eliminated in about two-thirds of the total cases. All accessible enlarged glands should be removed, even up to the cardia. The method of joining the stomach and duodenum has had to be altered, as a result of the more radical method of operating, and Billroth's original procedure is only practised in exceptional cases. Billroth's second procedure, which consists in closing both duodenum and stomach and re-establishing communication by a gastro-enterostomy, is usually employed.

The high mortality of the operation is chiefly due to peritonitis and to pneumonia, which may or may not be associated with gangrene of the lung. The peritonitis is the result of imperfect technique, but this is fortunately improving year by year. The cause of the pneumonia is uncertain, but Mikulicz suggests that it is embolic in origin. Further improvement in results will probably follow on earlier diagnosis, as the smaller the cancer, the easier and more rapid will the operation be, and the more likely to be followed by recovery.—*Centralbl. f. Chir.*, Leipzig, November 30, 1901.

PENETRATING WOUNDS OF THE DIAPHRAGM.

SCHLATTER records two cases of stab-wound of the lower part of the chest, attended with hæmothorax. In the first case the ninth rib was divided, there was severe anæmia and vomiting, from which it was inferred that the diaphragm was implicated. The wound, which was situated in the right axillary line, was enlarged, and portions of ribs were resected; a wound 3 cms. in length was found in the vault of the diaphragm, from which blood was escaping freely, the blood coming from the abdominal cavity. The wound in the diaphragm was enlarged and the finger introduced; both the liver and kidney were found to have been penetrated. The visceral wounds were closed with stitches; the diaphragm, pleura, and skin were stitched in succession. In the second case there was a stab-wound in the right mammillary line at the level of the seventh intercostal space. There was found a similar bleeding wound in the diaphragm, but the peritoneal cavity was not opened into. The several wounds were closed with stitches. Both patients made an uneventful recovery.—*München. med. Wchnschr.*, No. 34, 1901.

STAB-WOUND OF BLADDER THROUGH THE GREAT SACRO-SCIATIC FORAMEN.

THIS extremely rare injury was observed and recorded by Weischer. Two workmen engaged in mowing quarrelled, and one drove his scythe into the other's left buttock. The removal of the blade was attended with difficulty, and was immediately followed by the escape of blood and urine, and from then onwards all the urine escaped by the wound. Five days later the patient was admitted to hospital. There was a granulating wound discharging pus and urine in the left buttock, situated in a line between the posterior iliac spine and the great trochanter. The finger entered a canal which passed through the great sciatic foramen. There were no signs of peritonitis. A tube was introduced into the wound to drain away the urine, and the rest of the wound was packed with iodoform gauze. The existing cystitis was much improved by irrigations carried out by way of the urethra. Three weeks later the drainage tube was removed, the wound healed rapidly, and the patient was discharged quite well a fortnight later. The author was inclined to believe that the weapon had opened the peritoneal cavity before penetrating the bladder, and that the free escape of urine externally was the means of averting peritoneal complications.—*Centralbl. f. Chir.*, Leipzig, December 7, 1901.

LEUCOPLAKIA OF THE BLADDER.

VERRIÈRE records two cases of this from Rafin's clinique at Lyons. The first, a man æt. 58, who had twice in his youth suffered from gonorrhœa, began to suffer from frequent and painful micturition, and other symptoms of cystitis. He had undergone an internal urethrotomy for stricture. The prostate was enlarged, and there was pus in the urine. He was feverish, and had lost flesh. The bladder was opened above the pubes, and an indurated white patch about the size of a one-franc piece was discovered and removed with curved scissors, and the raw surface was touched with the thermo-cautery. The patient improved under further treatment, but all the urine escaped by the suprapubic fistula, which was fortunately continent. The portion of mucous membrane removed resembled a patch of buccal leucoplakia, only it was thicker, whiter, and more easily detached from the submucous tissue. Microscopically it presented the structure of stratified squamous epithelium, resembling that of the skin. The second case, a man æt. 59, had also suffered from gonorrhœa in his youth. At the age of 49 he began to suffer from cystitis, and on two occasions a stone was removed by lithotrity. The cystitis continued, the urine was purulent and fœtid, and a third stone developed. The operation of suprapubic lithotomy was performed, two stones being removed; but before it was completed the respiration became embarrassed, and the patient died on the table. The bladder was diminished in capacity, its walls thickened, and two large areas of leucoplakia were found in the mucous membrane, one at the base and the other at the right side of the neck. On microscopical examination, the wall of the bladder showed the usual lesions associated with chronic cystitis, the vessels in the submucous coat were remarkably numerous and engorged with blood, and the epithelium presented the stratified arrangement normally present in the mucous membrane of the mouth. This condition of vesical leucoplakia has been described by Rokitansky, Marchand, Hallé, and others. It may affect the mucous membrane as a whole, but is more commonly met with in patches. It is a sequel of chronic cystitis or pyelitis of varied etiology; when associated with stone, the latter is always phosphatic in character, and is secondary to the cystitis. Like the corresponding affection of the tongue, it may be the starting-point of epithelioma. It may be diagnosed clinically by examining the centrifuged urinary deposit after staining with picro-carmine, the appearance of squamous epithelial cells which have undergone keratinisation being characteristic. While it is capable of being improvéd by measures directed towards the co-existing cystitis, the most certain treatment consists in opening the bladder above the pubes, and in scraping or clipping away the affected patches of mucous membrane.—*Ann. d. mal. d. org. génito-urin.*, Paris, November 1901.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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PUERPERAL THROMBOSIS OF THE VEINS OF THE TRUE PELVIS.

HEIDEMANN (*Monatschr. f. Geburtsh. u. Gynaek.*, Berlin, April 1901) has observed twenty-seven cases of this condition, which he finds is frequently associated with uterine infection. Fever may be absent, and the thrombi in the veins of the lower limbs do not make their appearance frequently till the end of the first week. Headache, lassitude, rapid pulse, together with tenderness on pressure either over the uterus or the side of the pelvis on which the thrombus is about to form, may be regarded as prodromata. Heidemann attaches much importance to a sign which now appears, namely, abdominal distension. The prognosis depends much on the condition of the heart. Weakness, which is generally present, must be combated by stimulants; and the meteorism, which has a pernicious influence on the heart, requires immediate attention. Heidemann believes that the thrombosis arises from infection through the placental site.

OSTEOMALACIA.

VRLEANIC (*Liecnicki viestnek*, Nos. 3 and 4, 1901) in four years has had under his care in Gospić twenty-nine women suffering from osteomalacia. It is remarkable that all came from one county in south-west Croatia. The climate of that region is keen, dry, and healthy; the formation is chalk. In the valleys, malaria and pellagra are common diseases. The inhabitants are very poor; overcrowding and insanitary dwellings are the rule; their food is insufficient, and is largely composed of milk and starchy materials. The disease is found amongst multiparæ whose ages range from 25 to 45 years. The cause is obscure, but it is remarkable that the disease infests a mountainous region, the inhabitants of which are poor, and where overcrowding is common; and, further, that its victims are, almost without exception, women who have borne several children and suckled them for long periods.

The treatment lasted on an average seventy days; six were cured, and the remainder were greatly improved and were able to walk. From three to six teaspoonfuls of a solution of 2 per cent. of phosphorus in cod-liver oil were administered daily, and this was continued for from five to eight months. Quinine and iron were also administered. Warm baths were also employed, and found to be beneficial. In some cases spontaneous delivery occurred, in some Cæsarean section was performed, while in others induction of abortion or premature labour had to be resorted to. Induction of abortion in such type of cases is very difficult, owing to the narrowness of the pelvis. In conclusion, the indications for treatment are thus stated. In the osteomalacia of non-pregnant women, dietetic and treatment with cod-liver oil and phosphorus often give very good results, oöphorectomy being reserved for severe cases.

In pregnant women, if the last labours were easy, medical treatment as above should be adopted, with the hope that the coming labours may be spontaneous; but if the last labours were difficult and the disease advancing, it will be necessary to induce abortion or premature labour, and subsequently to perform oöphorectomy. If the case goes to full term, forceps may be tried. If those fail, Cæsarean section should be the procedure employed.

THE PRESENCE OF CYSTS, GLANDS, AND ADENOMA IN THE MYOMETRIUM OF ADULTS.

MEYER (*Ztschr. f. Geburtsh. u. Gynaek.*, Stuttgart, Bd. xlii. Heft 3) continues his work already published regarding the occurrence of those structures in the fœtus and child, and draws his conclusions from the examination of fifty-four uteri. In 22 per cent. of the specimens examined he found remains of Gärtner's duct, four times left-sided, six times on the right side, and twice on both sides. The lower part of the supravaginal cervix was the site where the remains of the duct were most frequently found. The extent of the course of the duct is a limited one, as Meyer found in the fœtus and child. If more diffuse, however, as it is in some cases, the condition is easily diagnosed. The duct is found in the lowest part of the uterine body, placed laterally, but becoming more median as it approaches the "os internum," where it is found immediately below the cervical mucous membrane. It is lined with a single layer of epithelium on a well-developed muscular coat. The lower part of the duct is wide as compared with the upper part, and the former is the commoner site of cyst formations. Meyer regards the ampullary portion of Gärtner's duct found in the cervix as homologous to the corresponding part of the vas deferens.

RETROVERSION.

FRANKLIN MARTIN (*Am. Journ. Surg. and Gynæc.*, September 1901), when operating for such cases, makes two incisions, one over each pubic spine parallel to Poupart's ligament, and raises the round ligaments. He now passes a forceps through one of the openings and grasps the ligament of the opposite side and ties it to the remaining round ligament in front of the parietal peritoneum. For this procedure he claims that both ligaments are equally shortened, that no sutures are necessary, and that there is no pain at the point of attachment, as so frequently occurs in the Alexander Adams operation. When performing ventrofixation, Martin cuts a strip of parietal peritoneum, the base of which is at the symphysis pubis; this strip is passed through a buttonhole which he forms at the fundus of the uterus, and the free end is then fixed to the upper end of the abdominal wound. Two temporary sutures are employed till adhesions have formed, and which fix the uterus in a correct position. The advantages claimed for this operation are that buried sutures are not required; that fixation is thorough; that a large range of movement is allowed; that the point of fixation is not a source of irritation and pain; that pregnancy can occur followed by a normal confinement; and, lastly, that the operation is simple and easily performed.

MYOMECTOMY DURING PREGNANCY.

EMMET (*Amer. Med.*, July 1901) reports nine myomectomies during pregnancy with delivery at term. In his paper which was read before the American Gynæcological Society, he quotes the opinions of various authorities, amongst whom may be mentioned Kelly, Delagenière, and Doléris, who are agreed as to the general rules to be observed regarding the treatment of the various cases where pregnancy is complicated by the presence of fibroid tumours of the uterus. Small myomas, and those situated at or about the fundus or even lower in the body of the uterus, frequently do not interfere with either pregnancy or delivery, provided they are pedunculated. Sessile tumours, except when placed near or at the fundus, are very liable to cause abortion. When myomata are situated at the isthmus, myomectomy is justifiable, because such tumours will most probably interfere with delivery. Fibroid tumours of the pregnant uterus may then be divided into three groups—(1) Pedunculated, which are unlikely to interfere with normal pregnancy and delivery, except where, from their size or situation, they block up the pelvis; such tumours rarely call for surgical interference. (2) Subperitoneal and interstitial tumours, which frequently cause abortion; in such cases removal is not indicated as an elective measure. (3) Sessile, or partially or completely pedunculated growths, so placed that they will interfere with descent of the head and delivery, require myomectomy unless Cæsarean section or craniotomy has been determined on as proper procedures when the case reaches term. Statistics extending over 20 years prove that if myomectomy be performed with proper care, and precautions taken against undue violence, the life of the fœtus will not be sacrificed.

Emmet reports a case in his paper where he removed from the uterus nine myomata, some of which were subperitoneal and some interstitial, without causing premature labour. The following he regards as being important points in the technique of the operation. The uterus should be supported—held steadily by an assistant, great care being taken to avoid jerking or handling the uterus unnecessarily. In enucleating each tumour, traction on it should be avoided, the peritoneum and interstitial tissue enclosing it should be pushed back till its bed is reached, from which it should be gently freed. This method, though slow, does not excite the uterus, while bleeding is reduced to a very small amount. During the first three or four days after the operation the patient should receive a morphia suppository night and morning, so as to obviate as much as possible any tendency to uterine contraction.

THERAPEUTICS.

UNDER THE CHARGE OF

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The Potato Cure of Diabetes.

Carbohydrates are essential for the nourishment of diabetics, but more than other foods they are liable to increase the hyperglycæmia. The dietetic problem consists in finding out in what form and in what proportions the carbohydrates can be given with least injury. The least injurious carbohydrate is the potato; but, as a rule, it is rigorously proscribed in the diet sheet, or, if at all given, in small amounts of 100 to 300 grms. As the result of five years' investigations, Mossé states that in diabetes potatoes are not only permissible, but are useful, as they can be advantageously substituted for bread, if given in sufficient amount to afford the same food value; that is to say, for each lb. of bread give 2½ to 3 lb. of potatoes. As a rule, 2 to 3 lb. of potatoes were well borne, and caused a rapid diminution in the general symptoms and glycosuria.

As a rule, at each repast, instead of bread, two, three, or four potatoes, baked or stewed, are taken; they are not given boiled. It is usually held that 3 lb. of potatoes are equivalent to 1 lb. of bread as regards nitrogenous and starchy substances. But potatoes contain much more water and mineral salts. The latter consist chiefly of potassium salts. Mossé records cases which show that this simple modification of the diet gives great improvement as regards glycosuria and general symptoms in all forms of diabetes, whether in stout, gouty individuals, or emaciated condition due to deficient pancreatic action, or to nervous or other unknown causes. He shows that the improvement is not due to the non-absorption of the potatoes, as examination of the fæces showed that the carbohydrates are as completely utilised in the potato diet as in the bread diet.

In addition to the reduction of sugar in the urine and general improvement as regards thirst, fatigue, dryness of skin, etc., in several cases it was noted that chronic sores, such as boils and whitlows, which had resisted ordinary treatment, rapidly improved after the substitution of potato for bread.

Mossé considers that the favourable action of the potato diet consists in the fact that the patient takes six times as much water and three times as much salts as in an equivalent bread diet. One kilogram of potato contains 4·9 grms. of potassium salts, so that to some extent the potato cure may be considered as an alkaline cure, which may possibly stimulate the deficient glycolytic action.

As regards efficiency and sureness of action, Mossé would place the potato cure above all the methods of treatment at present in vogue. It only failed to act in one out of twenty cases. He does not claim that it is a cure of the disease, but simply an indirect method of stimulating the deficient glycolytic action. At present Mossé is unable to lay down any contra-indication to this diet, but he advises that it should be carried out under medical supervision.—*Bull. Acad. de méd.*, Paris, December 10, 1901.

TWO SEVERE CASES OF HÆMORRHAGE TREATED BY SUPRARENAL EXTRACT.

THE first case was that of a cabman, æt. 31, whose nose began to bleed during a fit of coughing. Despite frequent plugging, and the use of various styptics locally and ergot internally, the bleeding persisted. The posterior nares were plugged, and the patient admitted to hospital. The bleeding persisted for five days. The hæmoglobin had fallen to 15 per cent. There was great restlessness, and at night delirium. On the evening of the fifth day gauze soaked in suprarenal extract was applied. This checked the bleeding. The plugs were removed next morning. In the afternoon the bleeding commenced, but again yielded to the extract and did not recur, and the patient recovered. The next case was that of a servant girl of 18, who was admitted for persistent uterine hæmorrhage, which had lasted for five days. It could not be checked by ergotin, rest, and hot vaginal douches, so, after the blood count had fallen to 1,000,000 reds and Hb 12 per cent., the patient was chloroformed on the evening of the sixth day, and the uterus dilated and curetted. Biniodide and pure tincture of iodine were applied, but the bleeding persisted. A solution of adrenalin, 5 gr. to 1 oz. water, was then poured into the vagina, which caused immediate hardening of vagina, and closure of os with cessation of bleeding, which did not recur.—*St. Barth. Hosp. Journ.*, London, November 1901.

REPORT OF THE VIENNA PASTEUR INSTITUTE.

IN the years 1896–1900 there were 1200 patients; but of these only 1185 come into the report, as the others did not have a full course of treatment for some cause or other. Of the remaining 1185, there were 466 men, 205 women, and 514 children under 14 years of age. In nineteen cases after the cure was completed it turned out that the animal had not had rabies. Of the remaining 1166 people, in 526 cases it was proved by experiment or by the illness of other people attacked at the same time, that the animal was suffering from rabies. In 550 cases the diagnosis was made by veterinary surgeons. In ninety cases the diagnosis of rabies appeared justified from the circumstances.

Of these 1166 people, seventeen (1·45 per cent.) were attacked by and died of rabies; six people were attacked within fifteen days of the completion of the treatment, and three on the sixteenth or seventeenth day. In the report it is assumed that these nine people were already ill before immunity was established. They are therefore deducted, and the actual mortality, after completed treatment works out at 0·68 per cent., while at the Paris Institute the figure is 0·28 per cent. The most fatal bites were those of the head and face, with seven deaths out of ninety-six cases. Then come the upper extremities, with nine deaths out of 747 cases. For the lower extremities there was only one death for 301 cases. The treatment, as a rule, lasts fourteen to fifteen days; in a few cases it lasted for twenty-one days. At the end of the report the fatal cases are described.—*Oesterr. San.-Wes.*, Wien, 1901, S. 357.

APPENDICITIS.

MITCHELL pleads for greater conservatism in the treatment of appendicitis. He considers that ten years hence it will be classed and treated as a medical disease. Skilful medical treatment takes 95 per cent. of patients through the first and second attacks. After the second attack is over the appendix may, if necessary, be removed. He recognises three conditions requiring surgical advice. First, in recurrent frequent appendicitis removal of the appendix between attacks is indicated. Secondly, if during an attack symptoms indicating suppuration, gangrene, or auto-infection occur, together with local signs of pus, the appendix should be cut down on. The third condition is perforation; but this is the rare exception, much rarer than perforation in typhoid fever. For the first twenty-four hours Mitchell gives no food by the mouth. Then, after the bowels have been moved by frequent small doses of calomel, followed by drachm doses of magn. sulph., he gives milk and gruel. To encourage thirst, these should be well salted. He advocates frequent draughts of water, to which are added 1 drm. hydrog. perox. For nausea he uses cocaine or chloretone. After the bowels have been freely moved, he gives salol and bismuth. For severe pain he gives fomentations. Should morphia be required, he gives at each injection 1 gr. of calomel by the mouth, to prevent constipation, as he finds that, if bowels are kept freely open, the pain is better borne, and complications are fewer.—*Therap. Gaz.*, Philadelphia, November 1901.

ARSENICAL NEURITIS FROM MEDICINAL DOSES OF FOWLER'S SOLUTION.

THE patient was a girl of 23, who was treated for chlorosis and palpitation by arsenic in increasing doses. Commencing with a single drop twice daily, the dose was increased each day by a drop until ten drops were taken twice daily. This dose was then taken for six weeks. When fifteen drops daily were being taken, the first symptoms of intoxication appeared in the shape of œdema of the feet, hands, and face. As the doctor persisted in the use of arsenic, pigmentation set in. There was frequent micturition, pain and burning in the urethra, and hæmaturia. Later there was neuritis, involving the legs first and then the arms, with paræsthesia and paresis. The patient continued the arsenic till she was quite bedridden, when she was removed to hospital. The condition gradually improved during a stay in hospital of three months, and ultimately a complete cure was obtained. In all, during two months the patient took 18 drms. of liq. arsenicalis, the first symptom of neuritis occurring after 15 drms. had been taken. The largest single dose was 10 minims or 20 minims in the day. The daily maximal dose of the German Pharmacopœia is 34 min. The patient had previously frequently taken arsenic without ill effects.—*Wien. klin. Rundschau*, No. 41, 1901.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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THE RELATION OF THE VAGUS NERVE TO DEATH BY HANGING.

PLACZEK (*Vrtljschr. f. gerichtl. Med.*, Berlin, 1901, Heft 4) submits to critical consideration and investigation the view, which is held by many authorities, that in death by hanging, factors other than occlusion of air from the lungs, namely, compression of the carotid arteries, jugular veins, and of the vagi nerves, play an important part in the production of rapid unconsciousness and the fatal result. The view held by early writers on medical jurisprudence, that in hanging death was due to constriction of the larynx or trachea, underwent alteration when it was proved that in the majority of cases the occlusion of air from the lungs was not produced by direct pressure on these parts, but through the root of the tongue being pushed upwards and backwards against the posterior pharyngeal wall, thus completely closing the pharynx above the larynx. Hofmann was able to show conclusively that the rapid onset of unconsciousness which occurs in hanging was not due solely to asphyxia, but was partly brought about by the ligature compressing the carotids, and thus interfering with the blood supply to the brain. Others demonstrated that not only are the carotids compressed, but also the jugular veins and the vertebral arteries; while it was also generally believed that a third factor—compression of the vagus

—exerted a material influence. The rôle played by the vagus, although usually admitted, was never proved, and in the present paper Placzek has endeavoured to determine the question. He investigated in the first place whether the nerve, at the site of the supposed pressure exerted upon it, showed any anatomical changes such as one might expect to result, and corresponding to the rupture of the intima coat of the carotid artery under analogous circumstances. In eleven cases of hanging which he had the opportunity of examining, no anatomical evidence of any compression of the vagus could be discovered, and the same negative result was obtained in several cases of death from other causes, in which the body was suspended, experimentally, post-mortem. A series of experiments on rabbits was then undertaken to determine whether, even although no macro- or microscopic changes are produced by the compression to which the nerve is supposed to be subjected, its functions may, notwithstanding, be interfered with. With this object the phenomena attending death, and more especially the changes in the circulation and activity of the heart, were carefully observed in rabbits which were suspended by a ligature encircling the neck—(1) with the carotid arteries and vagi nerves outside the ligature; (2) with the vagi included by the ligature but not the carotids; and (3) with the carotids included and the vagi outside. The results obtained are of considerable interest, but do not lend themselves to a satisfactory abstraction. The conclusions arrived at by the author are, that the inclusion or non-inclusion of the vagi within the ligature has no influence upon the activity of the heart, and that there is not the slightest foundation for the belief that the vagi undergo compression by the ligature in hanging.

THE VALUE OF ALKALINE HÆMATOPORPHYRIN AS A PROOF OF THE PRESENCE OF BLOOD IN MEDICO-LEGAL CASES.

The hæmatoporphyrin test for blood is recommended as one of the most satisfactory of all on account of its delicacy and reliability, and from the fact that it can be successfully employed under conditions which render other tests inapplicable, while it is also very simple and easily performed. The advantages of this test have been advocated by Kratter, who employed acid hæmatoporphyrin. The author found that under certain circumstances the presence of organic matters interfered with the success of the test, and he therefore tried to overcome this disturbing factor by producing *alkaline* hæmatoporphyrin. The following method of performing the test is recommended by him: The material with the suspected blood-stain is cut into very small pieces and treated with concentrated H_2SO_4, in which it is allowed to remain for twenty-four hours (*e.g.* to a piece of blood-stained linen the size of the hand 10 c.c. of H_2SO_4 was added). At the end of this period complete charring will have taken place. The matter is then filtered through glass wool, a process which takes a considerable time. The filtrate, a thick, dark fluid, is shaken up frequently with distilled water and then neutralised with strong ammonia. A brown flocculent precipitate quickly falls, and this is washed several times by decantation with distilled water. The precipitate is now thoroughly stirred up with equal parts of absolute alcohol and strong ammonia, and filtered. The filtrate is a more or less deep red fluid, which on spectroscopic examination shows the characteristic four bands of alkaline hæmatoporphyrin. The author applied the test under various circumstances in which other methods were inapplicable, and was always successful in obtaining a distinct spectrum of alkaline hæmatoporphyrin *Vrtljschr. f. gerichtl. Med.*, Berlin, 1901, Heft 4.

Artificial Blood Extravasations in the Dead Body.

Richter (*Ztschr. f. Med.-Beamte*, Berlin, October 1901) indicates by the above title not those petechial ecchymoses which, it is well known, may arise post-mortem, but such as are produced by the handling of a dead body, or which arise during the process of dissection. Many years ago Hofmann drew attention to the frequent occurrence of small extravasations of blood along either side of the vertebral column in the thorax, which might be mistaken for *intra vitam* ecchymoses, but which he proved to be the result of an escape of blood from the ends of the intercostal vessels, divided during the removal of the thoracic organs. Richter has noted the occurrence of similar small blood extravasations during the process of the post-mortem dissection in various other parts of the body—such as the scalp, meninges, neck, lungs, and abdomen. These he designates by the term "artificial" ecchymoses; and their importance depends upon the fact that they may be regarded as having been produced during life, and thus their presence be held to support a theory that death has resulted from some form of violent asphyxia. A second class of "artificial" ecchymoses may be produced by the manipulation of a body after death—as, for example, in lifting and carrying it, or during the process of atttempted resuscitation. These occur, as a rule, only in heavy, stout persons, or those in whom the small subcutaneous vessels are diseased; and the mode of causation may be recognised by their localisation—*e.g.* upper arm—and circumscribed character. It is quite conceivable, however, that they may give rise to erroneous conclusions, and be attributed to the effect of violence inflicted during life, if the possibility of post-mortem causation be not kept in view.

Poisoning by Lysol.

Burgl (*München. med. Wchnschr.*, 1901, No. 39) records two fatal cases of lysol poisoning, one an infant of five days and the other a child of eight, and gives an interesting resumé of the other cases (sixteen) which he has been able to find mentioned in literature. Lysol, which consists of a solution of one part of coal-tar creasote and one part of potash soap, has certain advantages over carbolic acid as a disinfectant, namely, it is a stronger antiseptic, while, on account of its being diluted with the soap, it has a diminished corrosive action. It is not, however, as has been asserted, non-poisonous, but when administered internally produces both a local corrosive effect and also a remote toxic action. When applied externally to the skin, or used for washing out the puerperal uterus, it has produced toxic effects and fatal results.

Of the eighteen cases reviewed by the author, in thirteen the substance was administered internally, and in five poisoning resulted from external application. Of the thirteen cases of internal administration, seven recovered and six died, while of the five cases of external application two recovered and three died. The deaths after internal administration occurred in children with one exception. The fatal dose in the case of children is about a teaspoonful. Of the deaths from external use, one occurred through its accidental application to the skin in a concentrated solution, instead of a 1 per cent. solution; another similarly, in a child suffering from a burn; while the third death resulted from the washing out of the uterus after expulsion of the placenta with 1500 c.c. of a 1 per cent. solution. The symptoms described are practically the same as those in carbolic acid poisoning,—collapse, cyanosis, and rapid unconsciousness being the most striking. The post-mortem appearances are also very similar, there being well-marked corrosion of the parts with which the lysol has come in contact, while there is, of course, the characteristic odour present. The question of treatment is of the greatest importance, as is seen from the fact that in almost all the cases in which the stomach was washed out, recovery took place. Lysol is very slowly absorbed from the stomach; and this accounts for the circumstance that even after large doses of a strong solution recovery may take place, without, also, any grave symptoms appearing. The treatment must therefore be to wash out the stomach as soon as possible, even in the case of the youngest child. If this cannot be done, then, according to Husemann, an emetic must be given, after previously having administered large quantities of fluid with the addition of acetic acid in order to neutralise the free alkali. The unconsciousness, as a rule, rapidly disappears on removal of the poison from the stomach; but if it does not do so, then washing out the bowel is strongly recommended. Lastly, in order to promote elimination of absorbed lysol as well as to prevent the occurrence of nephritis, large quantities of fluids should be administered, *e.g.* lemonade, sugar-water or coffee. In regard to the prophylaxis, the author recommends that lysol, when sold, should be labelled as a poison, since it is frequently put into ordinary bottles and mistaken for other substances.

A FATAL CASE OF ACETANILIDE POISONING.

CASES of antifebrin or acetanilide poisoning are not very rare, but the present one is interesting owing to the careful way in which the symptoms have been recorded by Dr. Brown. It is, however, to be regretted that the pathological changes found post-mortem do not appear to have been investigated with the same conscientiousness. A shoemaker, æt. 37, took, within a period of a few hours, 60 grs. of acetanilide, which had been prescribed for a headache, in the form of six powders. When first seen by a doctor he was slightly delirious, and complaining much of his head and of pain in the left umbilical region. The temperature was much elevated, the heart rapid, slight jaundice, nausea, and some vomiting. The urine became dark red. Calomel in small doses followed by salts gave a copious but bloody movement of the bowels. The patient lived eight days; and the following are some of the conclusions, based on the observations made by Brown during the treatment of the case in hospital. There was a general hyperæsthesia and not an anæsthesia, as is stated to result from a poisonous dose of acetanilide. There were increased reflex actions, and motor and sensory functions were retained practically to the end. The patient retained nothing on the stomach from the first, and was fed per rectum. Vomiting occurred frequently nevertheless. Arterial pressure was constantly low, the respirations were slightly increased. The temperature, raised at first, fell gradually to several degrees below normal. There was a progressive destruction of red blood corpuscles down to 1,116,000, with 30 per cent. hæmoglobin, on the day of death. There was a very marked leucocytosis, and a large number of nucleated red cells of all sizes. The alkalinity of the blood was diminished 80 per cent. (Quinan's method). There was hæmatoporphyrinuria twenty-four hours after the dose was taken, and, latterly, complete suppression of urine, acute diffuse nephritis, hæmorrhage from the intestines, and acute progressive jaundice.

The chief conditions found post-mortem appear to have been, slight enlargement of the spleen, which was of a brownish red colour, fatty degeneration of the heart muscle, and changes in the kidneys which are not clearly specified. The intestines showed chronic catarrh, the thickened mucous membrane being covered throughout with a dark green, thick, closely adherent mucus. There was no sign of recent or old hæmorrhage anywhere in the intestinal tract, in fact, nothing to account directly for blood-colouring matter in the stools.—*Am. Journ. Med. Sc.*, Phila., Dec. 1901.

DISEASES OF THE EAR, NOSE, AND THROAT.

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THE USE OF ADRENALIN IN AFFECTIONS OF THE THROAT, NOSE, AND EAR.

ADRENALIN, one of the active principles of the suprarenal gland, has now been a sufficiently long time before the profession to permit of a number of clinical observations being made upon its action. Among the various uses to which it has been put, we are only concerned here with its application in the nose, ear, and throat, where it has undoubtedly been found of very considerable value, and an improvement upon the suprarenal extract which was first brought under our notice. Adrenalin, which has been isolated from the gland in a crystalline form, combines with hydrochloric acid to form a solution of adrenalin chloride. This solution can be sterilised by boiling without apparently interfering with the properties of the substance. It can be obtained and used in the proportion of one part of the adrenalin to one thousand parts of normal sodium chloride solution containing 0·5 per cent. of chloretone, the latter being added with the object of giving a slight anæsthetic and antiseptic action to the preparation. If preserved in a cool place and not exposed to the light, it does not tend to decompose, and in this respect also it possesses a distinct advantage over the suprarenal extract. It may also be obtained in the form of tabloids. These consist of the tartrate of adrenalin, are very soluble in water, and when added to one drachm of water make a solution of one in a thousand. In this way they are very convenient for use, as it is only necessary to prepare what is actually required on each occasion.

By the addition of a normal saline solution in varying proportions, the strength of the mixture that is used can be made 1 in 3000, 1 in 5000, or 1 in 10,000, etc. Adrenalin raises the blood pressure and is a powerful vaso-constrictor, rapidly producing a marked anæmia of the mucous surface to which it is applied. It does not appear to have in itself either an anæsthetic or an antiseptic action; but when cocaine is applied in conjunction with it, the former drug apparently has a more efficient and more lasting action. Its physiological action upon the nasal mucous membrane may be prolonged for an hour or even for several hours. It may be applied in the form of a spray, by painting it upon the mucosa, or, when it is desired to obtain a bloodless field for operation, it may even be injected under the mucous membrane. It does not seem to produce any toxic effects when used as a local application. On account of its vaso-constrictor action, the drug has found its chief application in this field of work along the three following lines—(1) In more or less acute inflammation of the nose and throat, (2) in simple congestions due to a dilatation of the vessels, (3) as a hæmostatic in bleeding, or to prevent undue hæmorrhage in operations upon the nose and throat. We shall now proceed to examine its value when applied in these various conditions.

Norton Wilson, writing in *Laryngoscope*, St. Louis, July 1901, gives his experience in a number of instances. In acute coryza he found that the swelling of the turbinated bodies was almost immediately relieved, while the profuse watery discharge ceased to flow. In a case of acute laryngitis which came under his observation, where there was loss of voice and considerable pain on swallowing, the voice was restored in twenty-four hours, and the pain very much lessened after five applications of the spray. In acute pharyngitis and tonsillitis, the relief was immediate, and more lasting if combined with cocaine or eucaine. For the temporary relief of hay fever he had found no other remedy equal to it, and less irritation was produced by its use than in the case of the suprarenal gland itself. Operations within the nasal cavity could be rendered bloodless, or nearly so; but he found that after an hour or more some bleeding took place, though not to any marked degree. As these results are merely stated without any detailed account of the method employed, we turn next to the most recent paper upon this subject.

Moure and Brindel (*Rev. de hebd. Laryngol.*, Bordeaux, December 28, 1901, No. 52) record in the first instance certain cases of acute and chronic inflammation in which they made use of adrenalin. In a case of acute coryza, seen thirty-six hours after its onset, a solution of 1 in 1000 was applied to the nasal mucosa. Violent sneezing followed; but in a few seconds the membrane was blanched and the swelling diminished, leaving both nasal chambers patent. For six hours the passages remained free, and there was no sneezing; the secretion was not excessive. Thereafter the acute symptoms again manifested themselves, and became more aggravated towards evening. On the following day, however, all the phenomena of the coryza had disappeared. In a case of laryngeal tuberculosis requiring curetting, a solution of adrenalin 1 in 3000 was first applied, followed by a 10 per cent. solution of cocaine. The anæsthesia during the operation was very complete, and there was an absence of that reflex resistance on the part of the patient. Where used in a case of vasomotor coryza with considerable flow of secretion, the inferior turbinated bodies were painted with a solution of 1 in 5000. Pallor and contraction immediately followed, and the nasal chambers remained free for eight hours. A second application was made, four days later, with the same beneficial result. The patient remained free the whole day and slept with his mouth closed. Three days later, he was given a solution so that he might make the applications himself; and, according to his statement, the duration of the improvement after each application became greater. At any rate great relief followed its use, and his condition became much more bearable, and has been cut short.

It is interesting to note the effect of the drug on the mouth of the Eustachian tube in a case of dry middle ear catarrh. Before each catheterisation a few drops of a 1 in 10,000 solution of adrenalin was applied to the mouth of the tube, and this permitted the air to pass more freely, with an amelioration of the deafness. In their hands also, operations were rendered more bloodless. Before the removal of a polypus from the ear, a solution of 1 in 3000 was applied, and then a 10 per cent. solution of cocaine. The granulation was thus blanched and removed bloodlessly, with hardly any pain, and no secondary hæmorrhage followed. Similarly a spur was removed from the nasal septum, the solution in this case being 1 in 1000 followed by cocaine. Again the operation was almost bloodless, and without pain. With regard to its use in epistaxis, it must, of course, be remembered that in profuse bleeding it is of little use, as it is rapidly washed away. In a case of epistaxis treated by Moure and Brindel, a tampon soaked in 1 in 1000 solution and applied, caused rapid cessation of the hæmorrhage.

While individual experience with this drug undoubtedly varies, and while violent sneezing is induced in some cases by it, the fact remains that it will form a valuable addition to the drugs used in this branch of practice, owing to its powerful vaso-constrictor properties. In conjunction with cocaine, whether mixed with that drug or applied separately, the anæsthetic effect of the cocaine appears to be enhanced.

POST-DIPHTHERITIC STENOSIS OF THE LARYNX.

THE occurrence of laryngeal stenosis as a sequel of diphtheria in cases which have been intubated, or where tracheotomy has been performed, is by no means frequent. Nevertheless, cases of this kind do occasionally occur, and as they present certain features of very considerable difficulty in regard to treatment, it will not be out of place to draw attention to one or two recent papers upon the subject. It has been stated that this complication is probably met with less frequently after intubation than after tracheotomy; but, owing to the higher mortality after the latter operation, it is somewhat difficult to draw a fair comparison. Again, it must be noted that in a certain number of cases which have been intubated, it has been found necessary to perform a subsequent tracheotomy. Rogers (*Ann. Surg.*, St. Louis, 1900, p. 547) states that out of 900 cases intubated in the Willard Parker Hospital, New York, during six years, eight suffered from a chronic laryngeal stenosis; while von Ranke observes that in several hundred children who were intubated, stenosis occurred in one. Rogers also quotes other figures relative to this point; thus Galatti had two cases of stenosis in thirty-one intubations; Hubner, one in 250; and Bokai, two in 800.

The chief etiological factors concerned in the production of laryngeal stenosis in these cases are granulations, cicatricial contractions, infiltration and swelling of the mucous membrane over the arytenoid cartilages, and subglottic thickening. O'Dwyer, in a paper read before the American Pediatric Society in 1897, described the most common cause of the obstruction as an œdematous, chronically inflamed condition of the subglottic region. The same authority considered that it was rare to find granulations springing from ulcers produced by the pressure of an intubation tube.

The difficulty in dealing satisfactorily with this troublesome sequela is exemplified in the fact that various lines of treatment have been suggested and attempted. Of these we may enumerate the introduction of silk and linen threads, tents, and bougies: the use of dilators and of intubation tubes progressively increasing in size. Intralaryngeal division of the stricture has also been practised; laryngo-fissure or splitting the thyroid cartilage and dissecting out the cicatricial tissue followed by the insertion of intubation tubes, is a well-recognised procedure, which has not met with the most happy results.

In severer forms, where dense cicatricial tissue exists, excision of the strictured portions of the larynx or trachea has been carried out, followed by union of the divided ends; even extirpation of the diseased larynx has been practised. Certain plastic operations have also been attempted; Schimmelbusch dissected a flap from the anterior chest wall, consisting of skin, periosteum, and a thin layer of the sternum, by this means making a tube to replace the laryngeal canal. Fritz König carried out a somewhat similar operation, utilising a thin layer of skin and cartilage taken from the thyroid cartilage.

von Ranke has recently published another paper upon this subject (*München. med. Wchnschr.*, No. 43, October 22, 1901). In it he recites five cases of diphtheria in which temporary stenosis followed intubation and secondary tracheotomy. In all of these granulation tissue interfered with respiration *per vias naturales*. They were the only cases of the kind which occurred amongst 900 children intubated during a period of ten years. The age of the patients averaged from 1½ years to 5½ years. Three of them survived, with complete recovery of the respiratory function, while the remaining two died, one of gastro-enteritis, the other of miliary tuberculosis. In the latter case, respiration had been established through the natural channel for six weeks before death, so that recovery may be said to have occurred in four out of the five cases.

The treatment adopted by von Ranke in these cases practically consisted in re-intubating after it was found that normal respiration was impossible at every attempt to remove the tracheotomy tube. One case may be detailed to illustrate the course of treatment. A child, æt. 5½ years, suffered from diphtheria. Intubation was carried out; the tube was daily removed to test the patency of the larynx, but its reinsertion always proved necessary. Later, owing to the fact that the intubation tube did not serve the purpose, a low tracheotomy was performed. Four days later breathing through the larynx was attempted, by closing the outer end of the tracheotomy tube. As very little air passed through the larynx, intubation was again practised, the tube being left *in situ* for three hours. This was repeated daily, and five days later another trial was given to the laryngeal path. This again failed, but several granulations were now removed through the tracheotomy wound on changing the cannula. It then became possible for the child to speak for the first time, but normal breathing could only be maintained for a very short time. Three weeks later, more granulation tissue was coughed out through the tracheotomy wound. The intubation tube was again inserted, and allowed to remain for twenty-four hours. After its removal and after closing the tracheotomy tube, respiration through the larynx became possible for a much longer period. More granulation tissue was again coughed out, and appeared to come from the neighbourhood of the tracheal wound (subglottic). It now became possible to remove the tracheotomy tube for several hours, while during the night the intubation tube was inserted. The tracheotomy tube was finally removed, and the wound allowed to close, intubation also being finally given up, the respiration remaining free and the voice good. The duration of the treatment after the performance of tracheotomy was nine weeks.

The question of skin grafting in these cases of persistent laryngeal obstruction has been recently brought to our notice in a paper by Andrew M'Cosh (*Ann. Surg.*, St. Louis, November 1901). The writer quotes the case of a child who had been intubated for diphtheria, and on whom Alapy performed a grafting operation with perfect success, after attempts had been made for nearly one year to cure the condition by the use of tubes, dilators, and laryngo-fissure. In M'Cosh's own case, obstruction of the larynx followed the operation of thyrotomy, performed for the removal of multiple papillomata. The obstruction extended from the epiglottis down to the second ring of the trachea, and was so complete that no canal could be found, it being impossible to pass a probe through the cavity of the larynx. At the first operation carried out for the relief of the condition, the larynx was opened and some cicatricial tissue removed. The new and narrow canal thus formed was plugged with gauze. A second and a third operation were performed, and on each occasion more cicatricial tissue was removed, and finally a canal was established, through which a rubber tube was inserted, while the edges of the wound in the larynx was drawn over it by a silk suture. At a fourth operation more cicatricial tissue was excised, and the surface was then grafted. A large skin graft was rolled round a rod of gauze, the raw surface of the graft being outwards, and then laid against the bleeding surface of the new tracheal wall. The grafted section was 3 in. in length. As this operation proved quite successful, at a subsequent date the anterior wall of the windpipe was formed by freeing the skin edges of the wound and uniting them by sutures in the mesial plane. A tube was then inserted, reaching from the upper end of the tracheotomy cannula to the mouth, strings being attached to either end of it. The calibre of this tube was occasionally increased in size, and was worn for three months. Subsequently an intubation tube was inserted, and though the patient can breathe quietly without it, at the time of writing the tracheotomy tube had not yet been removed. This, however, was to be done at an early date, and the tracheal fistula closed.

APPEARANCES OBSERVED IN THE EYE IN THE INTRACRANIAL COMPLICATIONS OF MIDDLE EAR DISEASE.

SCHWARTZE records the observations made in his clinic since 1892 (*Monatschr. f. Ohrenh.*, Berlin, November 1901). In eleven cases of uncomplicated extradural abscess changes were found in the fundus in two cases—in one there was slight alteration noted, in the other optic neuritis was present. In thirty cases of purulent meningitis, fifteen showed ophthalmoscopic changes; thus in 23·3 per cent. there were slight alterations, in 23·3 per cent. optic neuritis, and in 3·3 per cent. choked disc. In four cases of tuberculous meningitis, there were changes in the fundus in two; in one of them but faintly marked, in the other optic neuritis. In eight cases of otitic intracranial complication which recovered, and in which the diagnosis was made clinically of serous meningitis, hyperæmia of the membranes, and œdema of the brain, seven showed changes, 50 per cent. having optic neuritis and 37·5 per cent. with less marked alterations. In eight cases of uncomplicated sinus thrombosis, one demonstrated slight vascular changes, one optic neuritis, and one choked disc. In twenty-one cases of complicated sinus thrombosis, ten showed some alteration in the fundus, five vascular changes, four optic neuritis, and one choked disc. The complications were, perisinus abscess in thirteen instances; extradural abscess in the middle fossa, and a temporo-sphenoidal abscess in one case; two abscesses on the inner surface of the dura, and a perisinus abscess in one case; cerebral abscess in one case; cerebral abscess and perisinus abscess in four cases; cerebral abscess and purulent meningitis in one case. In twelve cases of cerebral abscess, there were six showing alterations in the fundus, in two slight, in four optic neuritis. In seven cases of cerebellar abscess, five had a normal fundus, while two had optic neuritis.

PUBLIC HEALTH.

UNDER THE CHARGE OF
CHARLES HUNTER STEWART, M.B., D.Sc.,
PROFESSOR OF PUBLIC HEALTH, UNIVERSITY OF EDINBURGH;
AND
T. BUCHANAN YOUNG, M.B.,
ASSISTANT TO THE PROFESSOR OF PUBLIC HEALTH, UNIVERSITY OF EDINBURGH.

Anopheles and Malaria.

Etienne Sargent (*Ann. de l'Inst. Pasteur*, Paris, tome xv. No. 10) gives the result of his researches, conducted in July, August, and September 1901, on the *Culicides* of the banks of the Essonne, a tributary of the Seine. In this district malaria was formerly endemic, but has now entirely disappeared. The river rises on the northern borders of the forest of Orleans, and runs through the wooded and humid provinces of Gâtinais and le Hurepois to join the Seine at Corbeil. Its length is about eighty kilometres (nearly fifty miles).

Dr. Sargent examined thirty ponds in the district, and in twenty-two of these he found the larvæ of *Anopheles*. As a result of his investigations, he does not agree with Nuttall (*Journ. Hyg.*, 1901, vol. i. No. 1, Cambridge), "that it is not a matter of geographical distribution of *Anopheles* as much as of their numerical distribution. We are fully aware that numerical estimates permit a considerable degree of error. Nevertheless they would always possess a relative value."

Comparing his present results with those got by him in October and November 1900 in the neighbourhood of Alger, he states that he found *Anopheles* more easily and in greater number on the banks of the Essonne than at Maison-Carrée and Jardin d'Essai, homes of malaria near Alger. Moreover, while in the latter places the proportion of *Anopheles* to *Culex* was about 1 to 20, on the banks of the Essonne the relation was approximately 1 to 10. The *Anopheles* found were *A. maculipennis* (*vel claviger*) and *A. bifurcatus*. The larvæ were almost always found along with those of *Culex*. They were often present in dirty, muddy water, and frequently in artificial water-tanks, and in the stagnant water-pools common in kitchen gardens; and on one occasion the larvæ of *A. bifurcatus* was found in a cart rut. None were found in the peat mosses of le Hurepois, although there the water though stagnant was pure. Wild mint was often found growing on the banks of natural ponds containing *Anopheles*.

The disappearance of the malaria, Sargent suggests, may be due to several causes acting together, namely, damming in of rivers and wooding of their banks, improved hygiene among the inhabitants, and to some extent the use of quinine, though there is some popular prejudice against its use. He thinks that the presence of the *Anopheles* may be a source of danger to the inhabitants of the district. Colonists and soldiers returning to their native district, having had malaria abroad, very often have, when just returned, fresh febrile attacks; and the disease might be transmitted from them to healthy persons by the *Anopheles.*

THE PREVENTION OF THE SPREAD OF YELLOW FEVER.

DR. W. C. GORGAS, chief sanitary officer, Havana, describes (*Med. Rec.*, N. Y., vol. lx. No. 10) the steps taken by the sanitary department there for the repression of yellow fever. Prior to February 1901, when a case of yellow fever was notified the patient was put under guard, and no one but the attending physician and the inspectors of the sanitary department were admitted to the apartments in which he was treated. When the case was disposed of, disinfection of the apartments was carried out by the authorities, the walls and floors being washed with perchloride of mercury solution (1 in 1000), and, after careful closing of cracks, etc., the rooms disinfected with formaldehyde (1 litre of 40 per cent. formalin solution per 1000 cubic ft. of space). In view of the recent experiments of Drs. Reed and Carroll of the U.S. Army, which prove that the infectious agent in yellow fever is transmitted by the mosquito, the authorities recognised that this method only destroyed the mosquitoes in the room at the conclusion of the case, and the infecting mosquitoes had ample opportunity of escaping from the room during the treatment of the case. Accordingly, in February the following method was adopted. Immediately on the notification of a case of yellow fever, the chief of the disinfection department visits the house and requests those interested to select the apartments in which they desire to be quarantined. Wire-screen doors and windows are then fitted to the apartments, which are thus rendered mosquito-proof. This measure is intended to keep in infected mosquitoes and prevent any more getting access to the apartments. The screening, Dr. Gorgas states, is usually effected within two hours from receipt of notification, and a guard is placed at the house to see that no unauthorised persons enter the quarantine area, that care is taken in going in and out of the door, and that sickroom hygiene is observed. The patient is allowed to be visited within limits by three or four immune persons. Whenever the rooms have been screened, the disinfectors proceed to kill the mosquitoes in the rest of the building. They carefully seal and paste all the rooms, and burn in them pyrethrum powder in the proportion of 1 lb. to every 1000 cubic ft. The burning of the powder, even in this amount, does not kill all the mosquitoes, and at the end of three hours the rooms are opened and the mosquitoes on the floor swept up and destroyed. Pyrethrum powder is generally employed, as it does not injure the articles in the room, and the smell is not particularly disagreeable. Where there is nothing that can be injured by the fumes, sulphur is employed. The three or four adjacent houses are similarly treated with pyrethrum, lest any of the infected mosquitoes should be there. On an average 150 lbs. of pyrethrum powder is used for each case.

Some interesting statistics are given in proof of the efficiency of the new method. According to Dr. Gorgas, the yellow-fever year in Havana begins on April 1st, the cases which occur in January, February, and March being the decline of the previous year's fever. From the beginning of April the fever slowly increases in amount, the maximum generally being reached in August or September. The following table shows the number of cases occurring in each of the first seven months of 1901 compared with those occurring in the corresponding months of the two previous years, *i.e.* since the American occupation, no record of cases having been kept prior to that time:—

	1899.	1900.	1901.
January	2	19	24
February	0	17	8
March	2	11	4
April	5	5	2
May	2	5	4
June	4	19	0
July	6	96	4

In the five months, March to July inclusive, in 1899 there were six deaths, in 1900 forty-four deaths, and in 1901 only two deaths. While admitting that in each succeeding year the general sanitary conditions of the city have improved, Dr. Gorgas thinks that "there is not sufficient difference between this year (1901) and last to account for the great improvement in yellow fever conditions," and considers that it is in great part to be attributed to "killing the infected mosquitoes, and to the war against mosquitoes generally." Havana has no general sewer system, and every house has a cesspool. In these cesspools mosquitoes breed all the year round. As the water supplied to Havana is very hard, almost every house has means for collecting and storing rain water for washing purposes. In the barrels, etc., used for storing this fresh water, *larvæ* of mosquitoes are found in large numbers in the warm weather. To get rid of these breeding places, an order has been issued that fresh water is only to be stored in mosquito-proof receptacles, or covered with a layer of crude coal oil; and that crude coal oil should be thrown into cesspools once every two weeks. To insure the carrying out of this order, the city is divided into districts for the purpose of systematic inspection, every house being visited once a month. All yards are ordered to be kept as dry as possible, and drained. All ditches, etc., in the suburbs are carefully cleaned, and water not allowed to become stagnant. In consequence it is freely admitted that mosquitoes are now markedly less numerous than formerly.

Dr. A. H. Doty, health officer, Port of New York, *ibid.* No. 17, discusses the mode of transmission of the infectious agent in yellow fever in its bearing on quarantine regulations, and gives his personal experiences at the port of New York. He divides the vessels arriving there from yellow fever ports into (1) vessels which are a week or less in transit, *e.g.* from Cuban, Mexican, and Central American ports; and (2) vessels which are three weeks or longer on the voyage, *e.g.* from Santos, and Rio Janeiro. In the first class are the vessels from Havana, on which a large percentage of the yellow fever cases reaching the port are found. These are from three to five days on the passage, and, as a rule, discharge cargo in the open bay and do not enter dock at Havana. Vessels from Mexican and Central American ports are about a week on the voyage. Patients removed from vessels in this first class have invariably sickened within five days from the time of departure from the infected port, a large percentage having shown symptoms within forty-eight hours, and some even not feeling well at the time of sailing. The cases, as a rule, occurred amongst steerage and second-cabin passengers; and although there was always free exposure of others, not only to the patient, but also to his clothing, bedding, etc., no secondary cases ever occurred. When one of the crew of a vessel contracted the disease, it was always found that he had been ashore; and Dr. Doty is not aware of its having occurred among crews that have been kept on board, the vessels being anchored in the bay at Havana.

On vessels of the second class, *e.g.* from Rio and Santos, where the disease is very prevalent, it is not unusual for the captain or surgeon (where one is carried) to report that while at one or other of these ports, or within two or three days of leaving, some one on board sickened of yellow fever and recovered, or died and was buried in port or at sea. Their reports also show that no secondary cases occurred after five days' voyage from the affected port. Thus no cases of yellow fever reach New York from Rio or Santos, the cases either recovering or dying before reaching port. While admitting that instances are on record where the incubation period was seven days or more, no such case has ever come under Dr. Doty's observation, and he acts on the generally accepted opinion that five days is the maximum period of incubation. The treatment of incoming vessels from infected ports is therefore as follows: If they have been five or more days in transit and all on board found well after careful inspection and the use of the clinical thermometer, no detention or treatment of the vessel, crew, or passengers is necessary. If they are less than five days on the voyage, all on board who cannot present satisfactory evidence of immunity should be removed and put under observation until a period of five days has elapsed from the time of leaving the infected port. When yellow fever is found on board, the proceedings should differ only in the removal of the case or cases to a proper place for treatment. Dr. Doty is convinced that, in adopting this line of action, the authorities are, according to our present knowledge, affording full protection to the public without unnecessary restriction to commerce.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Obstetrical Society.—*Jan.* 8, 1902.—Dr. **Jas. Ritchie**, President, in the chair.—Dr. **Brewis** showed—(*a*) Cystic kidney weighing over 42 lb.; (*b*) calculus removed from pelvis of kidney; (*c*) large gall stone; (*d*) some fibroid tumours; (*e*) extra-uterine tubal gestation on point of rupture. All of the above were successfully removed by operation.—Dr. **Berry Hart** showed microscopic specimens of actinomycosis of the ovary.—Dr. **Lackie** read Dr. **Sandstein's** paper on "The Movements of the Pelvic Bones during the Operation of Symphysiotomy, and the true Function of the Section of the Pubic Symphysis." From experiments on cadavera, Dr. Sandstein held that the movements of the innominate bones were—(1) Rotation on a vertical axis passing through the sacroiliac joint. This movement carries the pubes apart and unlocks the sacrum from the socket in the innominate bones. (2) Rotation on a transverse horizontal axis, passing through both sacroiliac joints. This movement carries the pubes forwards. (3) Rotation of each innominate bone on its own long axis, extending from the sacroiliac joint horizontally forward. The ischia and pubes are thus carried more apart, while at the same time each pubis dips. Dr. Sandstein believed that the true significance of the division of the symphysis pubis in symphysiotomy was not that it permitted pubic separation, but pubic descent.—Dr. **Berry Hart** read a paper on "A Case of Full-time Intact Extraperitoneal Gestation, successfully removed after Five Years' Retention." The case gave a very clear history of retained extra-uterine gestation, and the physical signs were those of an extraperitoneal cyst reaching up to the umbilicus. On operation, the cyst was opened and the bones shown removed. They were in a perfect state of preservation, but nothing additional was found except a thick grumous fluid. There was some flesh on one of the legs and on the scalp. The opening in the sac was stitched to the abdominal wound, and the sac itself packed with iodoform gauze. The patient made a good recovery.—Dr. **Haultain** read a paper on "Expulsion of Dermoid Ovarian Cyst per vaginam during Labour." In this case labour was obstructed by a soft pelvic tumour. An attempt was made to extract the child by forceps, and, as the result of strong traction, a swelling appeared through the vulva, which subsequently became detached. It proved to be a dermoid ovarian cyst. The cavity was packed with gauze, and the patient made an uneventful recovery. Dr. Haultain referred to three similar cases, and then discussed generally the management of labour complicated by intrapelvic ovarian growths.

Edinburgh Medico-Chirurgical Society, *January* 15, 1902.—Dr. **Andrew** in the chair.—Dr. **Bramwell** showed two cases of syringomyelia.—Mr. **Stiles** showed—(1) A boy after operation for punctured wound (spike of railing) of brachial artery, opposite the origin of its superior profunda branch; (2) girl after second operation (excision) for plexiform angioma of the scalp.—Dr. **Elder** showed a man with transposition of viscera.—Dr. C. W. **Macgillivray** showed a case of obstruction of the bowels, in a child, with suppurating tuberculous retro-peritoneal glands —operation with recovery.—Dr. **Leslie Mackenzie** showed a simple form of spray pump for disinfection.—Dr. **Chalmers Watson** showed a series of photographs from a case of cerebral thrombosis in a horse unconscious for twenty-four hours, followed by complete recovery.—Mr. **Stiles** showed—(1) Portion of brachial artery from patient exhibited; (2) large (1¾ lb.) congenital strangulated cyst, removed, along with 6 in. of small intestine, from a child, æt. 1 year and 8 months, who was suffering from acute intestinal obstruction.—Dr. **Alex. Bruce** showed a transverse section of aortic aneurysm.—Mr. J. W. **Cotterill** showed—(1) Fœtus and sac successfully removed in a case of intra-peritoneal rupture of a tubal gestation; (2) aneurysm of the posterior ulnar recurrent artery; (3) semilunar cartilages taken from a series of cases of internal derangement of the knee-joint; (4) parts removed in a case of fracture of the sternum with dislocation of the spine; (5) kidney removed from a case of profuse hæmaturia.—Dr. C. W. **Macgillivray** showed a large papilloma of the rectum.—Drs. **Gibson** and **Stuart M'Donald** showed—(1) Spinal cord showing pseudo-tabes syphilitica, with microscopic demonstration; (2) hæmorrhage into the cusps of the pulmonary valve, with microscopic sections.—Mr. **Cathcart** gave a demonstration on an adaptation by Dr. Ramsay Smith of the freezing microtome for tropical climates, and of his rapid method of mounting permanent microscopic sections of fresh tumours. The specimen is frozen by ethyl-chloride sprayed directly on it, and by soaking in 2 per cent. formalin, staining, and dehydrating with alcohol; the section can be kept permanently if mounted in Canada balsam.—Dr. **Elder** read a paper on a successful case of removal of tumour from the left prefrontal lobe of the brain. The patient was operated on by Mr. Miles. Dr Elder first pointed out the difficulty of localising tumours in the frontal region, which is one of the so-called silent regions of the brain, about the function of which so little is known. Extirpation of the frontal lobes in monkeys has been followed by symptoms pointing to the higher function being interfered with. The patient, under discussion, complained of headache, occasional attacks of vomiting of the cerebral type, loss of memory, and other symptoms of mental derangement, the most marked of these being a lack of judgment and loss of any sense of decency. A painful swelling developed over the left frontal eminence. The bone was found to be carious, and the subjacent brain was incised and a hard tumour lying immediately under the surface was easily removed, the space it occupied being at once filled with the brain tissue. The tumour proved to be a gumma. The diagnosis lay between general paralysis and prefrontal lesion, which are frequently difficult to differentiate. The marked loss of inhibitory power is an important symptom of prefrontal lesions. Cerebral thrombosis, hæmorrhage, and abscess have also to be excluded.

Glasgow Medico-Chirurgical Society.—*January* 6, 1902.—Dr. J. **Fairlie Gemmell** gave a demonstration with the projection lantern, on the structure of the types of double monstrosity occurring in osseous fishes. He showed, by means of a set of stained sections, the arrangement of the principal organs at the transition region from the double to the single condition, in the following types:—(1) Union in head region, the central nervous system being single up to the mesencephalon, while the fore-brain is double. (2) Union in pectoral region. (3) Union in abdominal region. (4) Union in caudal region. He called attention to the illustrations afforded by his specimens of the laws which regulate the structure of double monsters in vertebrates generally, and pointed out that the comparative simplicity and symmetry of piscine anatomy made it easier to illustrate these laws in fishes than in the higher vertebrates.

January 17, 1902.—Dr. J. H. NICOLL showed three cases of lumbar spina bifida treated by excision. In one of the cases, which was operated on six months ago, there was marked paraplegia.—Dr. W. R. JACK showed a case of congenital stenosis of the pulmonic valve in a girl 19 years of age.—Dr. ALFRED YOUNG showed—(*a*) A case in which choledochotomy was performed, and a solitary gall stone removed. The gall bladder was found contracted and thickened and bound down by adhesions. The common bile-duct was incised and a gall stone about the size of a hazel-nut removed from its interior. (*b*) A case of empyema of the gall bladder treated by operation. There were no gall stones.—Dr. WALKER DOWNIE reported on a case of sarcoma of the tonsil, enucleated two and a half years ago. There is now great induration of the glands behind the angle of the lower jaw. Dr. Downie considered further operation impossible.—Dr. J. W. ALLAN and Dr. HUGH M'LAREN showed specimens from a case of malignant disease of the œsophagus, complicated with aneurysm of the aorta, malignant cysts of the stomach, and septic pneumonia. A communication was found between the œsophagus and the upper lobe of the left lung.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*January* 13, 1902.—Mr. HENRY CLARKE, President, in the chair.—Dr. FREELAND FERGUS showed a patient operated on for ptosis by advancement of the occipito-frontalis muscle and tendon.—Dr. ALEX. NAPIER described two cases from the wards of the Victoria Infirmary, one of lymphatic leukæmia, and the other of pernicious anæmia.—Dr. JOHN ANDERSON demonstrated microscopic preparations of the blood and organs from the cases.—Dr. JAMES LAURIE showed a patient on whom Trendelenburg's operation for epithelioma of the lip had been performed.—Professor MUIR showed a large chondroma of the pelvis with myxomatous degeneration and secondary infection with pyogenic organisms, and various organs from the same case showing pyæmic abscesses.—Dr. LAURIE showed a calculus, weighing 4 oz., successfully removed from the bladder, and an ulcer of the ileum which had perforated; it had not been examined microscopically.—Dr. A. R. FERGUSON showed a specimen of ileum and caput cæcum passed per anum during spontaneous cure of intussusception, and a specimen of small intestine which had suffered complete transverse rupture (traumatic).

ANALYTICAL REPORTS.

Mazawattee Latariba Cocoa.

We have been honoured with some tins of the cocoa which has within the last few weeks been introduced to the public by the Company already known to fame as the purveyors of Mazawattee Tea. The Company evidently has had the courage of its convictions, has not had a shadow of doubt about the success of this new product; for has it not erected a huge establishment, installed elaborate machinery, and engaged an army of employees—all for the sake of a cocoa unknown beforehand to the public, and before success in the tickling of the cocoa-drinkers' palates had been ventured on?

This Latariba Cocoa is in the form of a fine discrete powder, darker in colour than most of the other cocoas on the market, with an agreeable perfume, and dissolving readily in water, without too much of that "caking," which is so often the source of trouble in the cup. The filtrate, after treatment with boiling water, has a dark brown madder tint, is practically neutral in reaction (though a slight diminution in its colour depth seemed to follow the addition of dilute acid), and failed entirely to cause any reduction of copper sulphate in alkaline solution at the boiling point. Comparison of the filtrate thus obtained and similar extracts from other cocoas failed to yield any striking differences, except that the colour of the former was slightly deeper. In the sample investigated, the reaction of the extract was perhaps faintly on the alkaline side, judging from the results from other cocoas, but as all were practically amphoteric, the point is of no importance, save in explaining the darker hue of its extract. One thing certain, at any rate, is that there is no free alkali present. Treatment of a portion of the cocoa with ether afforded a moderate proportion of fats soluble in this menstruum; a reasonable portion, for cocoas over-wealthy in fat usually prove over-rich for digestion.

But the one real test of all articles of food, necessary or accessory, is the ingestion thereof; so we ingested of the cocoa *quantum sufficit*, prepared as directed; and the same commended itself. Cocoas there are that taste thin; others that feel fat; others that might be the better of a more thorough acquaintance with their botanical namesake; and again others pleasant to the palate, and a comfort after arrival at gastric regions to the well-being sense of the bowel and the brain, whatever the rights or wrongs of their actual chemical constitutions may be.

Now, Mazawattee Cocoa, also called Latariba (whence this latter?), compounded in the ordinary way, is very good—well flavoured, clean tasting, not heavy, as cocoas go; nor so insipid as some; undoubtedly is innocent of adjuvants, whether saccharin or starchy, or of the class of inert cheap bulk-givers—always excepting the official cocoa-flavouring agents; and presents the people of these isles with an excellent product, made at home, as good at least as other cocoas of home manufacture, even if they are able to boast of a longer existence, and probably time will prove it to be better. But the fact remains, that Mazawattee Latariba Cocoa is pure, palatable, pleasing, and powerful; that the devotee of the cup which, like tea, cheers without inebriating, but which, unlike tea, yields nourishment to the body; which, if it disagrees, disagrees through richness (and this does not encourage any such habit as that of theinemania, a habit leading to gastric tanning), may safely imbibe, up to the limits of his digestive tolerance, Latariba Cocoa, with the knowledge that he is getting from it full value for his money.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

Meteorological Means for the East of Scotland District, for the Five Weeks ending December 28, 1901; and for the Year from January 1.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean .	38°·4	[1] 50°	170°	3·4	31·7	40	1296	3°·2
		[2] 2370°	908°					
Observed	36°·6	[1] 40°	236°	3·4	28·4	39	1459	3°·6
		[2] 2527°	1041°					
Difference	−1°·8	[1] − 10°	+ 66°	± 0	−3·3	− 1	+163	+0°·4
		[2] +157°	+133°					

Vital Statistics.

Mortality in Four Large Towns in the East of Scotland (Edinburgh, Dundee, Aberdeen, and Leith), during December, and since January 1, 1901. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1899	[1] 1322	223·2	223	37·7	124	21·0	324	54·6	139	23·5
	[2] 13935	195·9	2737	38·7	1308	18·4	2692	37·8	1575	22·16
Actual Deaths and Rate per 10,000	[1] 1286	216·9	211	35·6	150	25·3	316	53·2	155	26·1
	[2] 13779	193·7	2786	39·15	1376	19·3	2425	34·2	1568	22·06
Difference from Mean	[1] − 36	−6·3	−12	−2·1	+26	+4·3	− 8	−1·4	+16	+2·6
	[2] −156	−2·2	+49	+0·65	+68	+0·9	−267	−3·6	− 7	−0·1

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1899	[1] 79	13·3	29	5·1	118	19·9	108	18·2	53	8·94
	[3] 952	13·2	360	5·0	1051	14·7	1348	19·7	630	8·85
Actual Deaths and Rate per 10,000	[1] 83	14·0	41	7·5	133	22·4	90	15·2	56	9·4
	[2] 1025	14·2	422	5·9	1129	15·8	1212	17·8	715	10·05
Difference from Mean	[1] + 4	+0·7	+15	+2·4	+15	+2·5	−18	−3·0	+3	+0·46
	[2] +73	+1·0	+62	+0·9	+78	+1·1	−136	−1·9	+85	+1·20

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* Note.—The figures [1] denotes the data for December, [2] for year.

The mean temperature of the five weeks ending 28th December 1901 was considerably below the average; the accumulated day-degrees over 42° F. were 30 per cent. below, those under 42° F. 38·8 per cent. above, the normal values. The rainfall coincided with the usual mean; as practically also did the duration of bright sunshine. The mean daily variability of temperature was greater than usual.

The total accumulated degrees of warmth over 42° F. for 1901 exceeds the mean value by 6·6 per cent.; the degrees of cold below 42° F. similarly surpass the mean by 14·6 per cent. The actual number of day-degrees of warmth over the normal, however, exceeds that of the degrees of cold by 24° (157° - 133°); exactly one-half of the excess in the degrees below 42° was afforded by the month of December. The rainfall of the past year exhibits a remarkable deficit, equal to 10·4 per cent. below the mean; indeed, seven months, numerically, 1, 2, 5, 7, 8, 9, and 10, in 1901, were characterised by abnormally dry weather, the total deficit almost averaging ¾ in. for each of these seven months. March and June were the only months yielding an appreciably augmented rainfall. Accompanying this greatly diminished rainfall there was an increase in the number of hours of bright sunshine recorded during the year; an increase proportionately somewhat larger than the decrease in amount of rain, being equal to 14·57 per cent. over the average.

The mortality returns for the last month of 1901 yield a distinct fall in total number of deaths below the normal. Constitutional diseases (- 5 per cent.), and among them phthisis (- 16·6 per cent.), and respiratory causes, contribute to this decrease. On the other hand, deaths from urinary diseases exhibit the extraordinary increase of + 51·7 per cent. over the mean; circulatory causes, with + 20·9 per cent.; pneumonia, + 12·7 per cent.; and nervous diseases, with + 11·5 per cent., also afford marked increases.

The values for the whole year 1901 disclose a slight reduction in the general mortality-rate, equal to 1·1 per cent. of that expected. The variations above or below the mean values for the nine years 1891–99, as recorded for 1901, and expressed in percentages of the means mentioned, are shown in the table following. The analogous data for 1900 and 1899, as given last year, are also shown:—

	Per Cent.		
	1901.	1900.	1899.
Total deaths	− 1·1	− 1·7	− 2·2
Urinary diseases	+18·05	+ 5·4	− 4·6
Cancer	+13·49	+ 9·7	+19·8
Digestive diseases	+ 7·66	+ 3·8	+13·0
Pneumonia	+ 7·4	+13·2	+ 5·8
Circulatory diseases	+ 3·19	+ 6·5	± 0
Constitutional diseases	+ 1·76	+ 6·1	+ 6·9
Nervous diseases	± 0	+ 1·04	+ 1·3
Respiratory diseases	− 9·9	− 7·7	−14·9
Phthisis	−10·08	+ 2·9	± 0
Pneumonia deaths per cent. of total respiratory	+ 7·5	+ 8·6	+ 9·1

From the table it is clear, although the actual proportional diminution in mortality for 1901 is less than in 1900, and still less than that of 1899, that during the last three years the four large towns in the East of Scotland, included in these statistics, have shown a progressive fall in their death-rate.

Referring to the several divisional causes of death discussed, two especially striking facts stand out: the great rise in the death-rate from urinary diseases; the marked fall in that from phthisis. Deaths from cancer also greatly exceed the total expected.

For the third year in succession the proportion borne to the total respiratory deaths by those caused by pneumonia offers a considerable increase over the mean calculated. If the deaths from respiratory causes, apart from pneumonia, are considered separately, they present a fall of 21·02 per cent. below the mean rate for 1891–99.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

The Scottish Universities and the Necessity for Reform.

THE supremacy of the Scottish Schools as centres of medical education has long been vaunted by every patriotic Scot, and more than half suspected by everybody else. This ill-concealed boasting on the one hand, and secret sense of mortification on the other, have had very opposite effects on the parties most concerned.

The Scottish Schools, as regards the field of medical education, have been led into a spirit of false security, into an erroneous impression that their pre-eminence as teaching centres is unassailable. Consequently, at the present moment, the Scottish Universities are quite content to rest upon the laurels won for them by distinguished sons of the past, and to extend a grasping hand at any chance millions which may, or may not, be offered to them.

On the other hand, the sense of educational inferiority has acted as a strong incentive on numberless institutions south of the Tweed and in other parts of His Majesty's extensive dominions. The result is, of course, obvious—the numbers of medical students at the Scottish Universities steadily diminish, and the numbers elsewhere proportionately rise.

Such are the facts. They cannot be gainsaid. It is therefore necessary to arouse the Scottish Universities from that state of lethargy which is now their chief characteristic, and to sternly repress their recently developed money-grasping propensities.

Reform all round is urgently called for, and must be obtained. There is evidence that the necessity for such reform has already entered into the minds of those who can best enforce their demands, namely, the graduates and undergraduates for whom the Universities primarily exist. Nothing would be more satisfactory than to see the recognised authorities, of their own free will, initiate such drastic changes as are now absolutely necessary if the Scottish Universities are to maintain their previously pre-eminent position.

The chief and most pressing of these reforms is an inquiry by all the Scottish Universities into the present state of the medical curriculum with a view to its reorganisation.

There are also urgently wanted a readjustment of the class hours; the institution of three sessions per annum; a diminution in the number of some of the more useless lectures; the strengthening of the teaching departments; a more friendly recognition and a greater utilisation of extramural schools, where such exist; the curtailment of the, at present, autocratic powers of the Senatus Academicus, and the restoration of supreme power to its proper place—the University Courts; the strengthening of such Courts, and the free publicity of their proceedings; the abolition by the undergraduates of their political Lord Rectors, and the substitution of something more useful if perhaps less ornamental.

In addition to the foregoing might well be added an age limit to the occupancy of professorial chairs; an addition to the members of extra-academical examiners for graduation; the substitution of something more than a mere living wage for University assistants, and a little more regard for the ordinary elementary principles of justice in the appointment of the same—in other words, free trade for intellect, and a fair remuneration.

What are the Scottish Universities actually doing as regards such matters? Truth compels us to answer—nothing; nothing, that is in the way of reform, but a great deal for the perpetuation of abuse. All are grasping with outstretched hands at the Carnegie millions; Glasgow has already issued a report coolly claiming for itself a year and a half's income of the total Carnegie funds available for the whole of Scotland, Universities included. Edinburgh has not yet issued its claims on the Trust, but when it does, there is very good reason to believe that it will out-Glasgow Glasgow itself; in addition to which, Edinburgh is burning with a desire to found a School of Engineering, for which, besides the claims on the Carnegie Trust, an appeal to the public will also be issued for something like £100,000. The issue of this appeal will doubtless lead to some unexpected developments in the way of plain speaking, but that time is not yet. Aberdeen and Dundee are also forging ahead, but principally owing to private munificence, so that their indifference to reform is not quite so scandalous as in the other instances; whilst, lastly, Edinburgh is quite surpassing itself in the way of appointments, much to the chagrin of patriotic fathers south of the Tweed with sons desirous of a medical education, and to the detriment of the University itself.

Is the Scottish graduate to submit to this policy of *laissez faire* for all time? Is he for ever to see his Alma Mater made ridiculous in the eyes of the world, or is he going to compel the abolition of abuse and the substitution of reform? Even the undergraduate could induce his professor to lecture at the hour which best suits the educational well-being of the former, and not merely the convenience of the latter, were he so disposed, and did he not always delude himself with the idea that a Scottish professor is a species of Robinson Crusoe—"monarch of all he surveys."

If an undergraduate can do so much, how much more could be achieved by a judicious combination of all those interested in the important question of University reform in Scotland?

Will those who at present have the power, then, kindly put their house in order, and administer some badly needed reforms? If not, such reforms must be enforced. How, it will be the function of these pages to show.

Expectation of Life.

In part 2 of *Biometrika*, a journal which has recently been established for the statistical study of biological problems, there is an interesting article by Professor Karl Pearson, "On the Change in Expectation of Life in Man during a period of circa 2000 years." As the outcome of a comparison between the recorded ages of death of a certain number of Egyptian mummies, and the rate of mortality of our own times, Professor Pearson calculates that a man of 25 years to-day lives on an average fifteen more years than a man of 25 years did two thousand years ago, thus suggesting that, in the course of these centuries, man must have grown remarkably fitter to his environment, or else he must have fitted his environment immeasurably better to himself. Whichever be the correct explanation, both conclusions point perfectly definitely to an evolutionary progress. What, we wonder, will be the expectations of life two thousand years hence?

Examination and the Army Medical Service.

It is questionable whether the policy of promotion by examination is a wise one. In every examination the candidate has to sink his own individuality and conform to the views of the examiner. Under ordinary educational conditions there is little objection to such a course, for, as a rule, the examinee is still *in statu pupillari*, and the opinions he expresses are not his own, but those of his teachers. The matter is otherwise, however, where the candidate has his own experience to fall back upon, and in such circumstances he may express views at variance with those of his examiners, and so imperil the result of the examination.

It is no unusual thing to hear such an explanation offered of the downfall of men of real ability in the final fellowship examinations of the Royal Colleges, and though in most instances it is merely an excuse behind which the unsuccessful aspirant for surgical distinction takes shelter, it has happened, and happened more frequently than is desirable, that a thoroughly sound man has been rejected, simply because his views did not exactly coincide with those of his examiner. Such being the case, it seems rather a dangerous system to adopt in the R.A.M.C. There is surely some other and better means of forming an estimate of a man's ability than by a mechanical system of examination. The fact is, we are inclined to expect too much now-a-days; and the public, in sitting in judgment on the Army Medical Service, is rather apt to overlook the multifarious nature of the duties an officer in that service is called upon to discharge.

He must be not only a capable physician but an expert surgeon, a medical officer of health and an analyst; besides which he must know how to run a field or base hospital as well as a concentration camp. Under such conditions, is it surprising that he sometimes fails? Of recent times he has been criticised, and that somewhat severely, by young professional men of limited experience, many of whom, if called upon to do the same work, would have failed ignominiously. The consultants we sent to South Africa were no doubt distinguished surgeons, but it would be interesting to know how many of them would have been prepared to undertake the analysis of the water of a poisoned well.

To expect any man to possess the confidence and experience of a specialist, at short notice, is absurd; and so long as you look forward to finding up-to-date surgeons, midwives, specialists in fevers, sanitary science, water analysis, etc., all rolled into one, so long may you anticipate failures in the future.

It is obviously absurd, therefore, that in the public services we should seek to combine, in the one individual, functions and qualities which the experiences of civil life have taught us are unattainable. That there are abuses in the medical service of the army is undoubtedly true, that there are faults in the system is obvious to every one; but that these defects are to be remedied by an extension of the examination system is open to doubt.

Glasgow and the Carnegie Trust.

THE University Court of the University of Glasgow have issued a statement, setting forth their requirements in connection with the funds of the Carnegie Trust. The money applied for by the University may be grouped under two headings, namely, a Capital Grant amounting to £95,000, and an Annual Grant of £17,205; the total sum asked for is thus £112,205. It is proposed that this large sum of money should be expended in the following way:—Under the first heading, that of Capital Grants, part of the money will be devoted to the foundation of a Chair of Geology, the proportion to be set aside for this purpose being £7500. For the extension of laboratory accommodation, it is proposed that £75,000 should be utilised. The departments in the University requiring such assistance are—(*a*) Natural Philosophy, (*b*) Physiology, (*c*) Forensic Medicine and Public Health, (*d*) Materia Medica and Therapeutics, (*e*) Chemistry, and (*f*) Geology and Mineralogy. In addition to the above sum, necessary for laboratory accommodation, we find that a further sum of £6000 is asked for the equipment of these departments by the purchase of modern and improved apparatus. The last item which comes under Capital Grant is a sum of £6500 for the improvement of the University Library. The needs of this important branch of University education are described as clamant.

Under the heading of Annual Grants, the following sums are said to be requisite for the establishment of Lectureships and Research Fellowships, and for the maintenance of what is described in the Report as a Public Library:—Lectureship on Organic Chemistry, £400; Demonstratorships on a number of subjects in Medicine and Science, £5000; material and apparatus, £2000; Lectureship on Engineering, £375; Lectureship on Natural Philosophy, £400; and Lectureship on Vegetable Economics, £300; in the Faculty of Arts, Lectureships in Political Economy, English Language and History, each at £400; a Lectureship on Arabic and another on Italian, each at £300. It is further proposed to institute Research Fellowships for the Encouragement of Post-Graduate Work in a number of subjects in the Medical, Science, and Arts Faculties. For this purpose £2300 would be laid aside. Lastly, an additional sum for the annual maintenance of the Library is suggested, amounting to £2705.

In the above paragraphs the figures only represent the demands made by the University authorities upon the Carnegie Trust. A considerably larger sum than £112,205 is needed to satisfy the numerous requirements. An appeal to the Bellahouston Trustees, and to the Randolph Funds, has received a generous response, while a committee has been formed for the purpose of collecting further sums of money by public and private subscription. The total sum sought for by Glasgow from the Carnegie Trust is undoubtedly a large one, and if a proportionately similar amount is demanded by the remaining three Scottish Universities, the work of the Trust, in duly considering the various claims, will be by no means easy.

German Amenities.

AT this time, when the South African War has excited criticism of a far from complimentary nature from our continental neighbours, and when we read how statements, based on pure fiction or distorted by some willing "humanitarian," have not only been widely accepted by a considerable section of the German nation, but even regarded as incontestable proofs of our "cruelty," it is natural that one should look back on a recent personal experience. One is further urged to this by the perusal of an article in a recent number of *Blackwood*, dealing with the European slanders. The author traces the history of the Anglophobia, so freely indulged in by our neighbours, and with justice condemns their conduct in vigorous but withal temperate language.

We owe it to the medical profession in Germany to make a reservation in their case. It is to us a great pleasure to record our own experience during a visit to some of the medical schools in the Fatherland. Throughout a stay of some six weeks, we experienced the utmost courtesy and friendly welcome. Every facility was given for seeing the work of the various cliniques. Any discussion anent the war was temperate and courteous, and it is with unqualified pleasure that we bear testimony to the fact, that the good fellowship which exists so widely in the medical profession was still so freely participated in by those of our German confrères with whom we came in contact.

A University for Liverpool.

LIVERPOOL has decided to have a university of her own, and already over £80,000 have been subscribed or promised for its support. A huge committee of influential Lancashire men has been appointed to further the scheme, which has been launched under the most favourable auspices. It is expected that the study of commercial subjects and of tropical medicine will be the main channel into which the activity of this new university will be directed, and the institution of a degree in commerce has been hinted at. It is open to question whether at this time, when the older universities are complaining of a steady diminution in the number of their students, and when, from overcrowding, the demands for a professional education are on the wane, the founding of new universities is wise. Liverpool, in breaking away from the threefold combination which constitutes Victoria University, practically forces Manchester and Leeds to found universities also, and so within the next decade the North of England will be supplied with three more corporations with the power of conferring degrees. This is a plethora: for it is unlikely that, for many years to come, these smaller universities will attract any considerable number of students from outside counties; and there are not in Lancashire and Yorkshire enough people with aspirations after a university education to keep three universities supplied with students. Besides, for many years the degrees issued by these bodies will not, except locally, have the same value as similar distinctions conferred by the older schools, and this will, of course, militate against their success. In the abstract, the multiplication of universities is an excellent thing; but in this case there is an element of untimeliness. A university cannot subsist without money, but money alone cannot make a university succeed.

Pathologist to the Edinburgh Infirmary.

THE vacancy caused by the translation of Dr. Welsh to the Chair of Pathology at the University of Sydney has been filled by the appointment of Dr. Theodore Shennan. The Infirmary is fortunate in having secured a pathologist of reputation and experience, who has thoroughly identified himself with the study and teaching of morbid anatomy. In view of the fact that Edinburgh has supplied professors of pathology to Aberdeen, Glasgow, Cambridge, Oxford, Belfast, and other medical centres, it is a matter for congratulation that we have still men coming forward worthy to fill such an important post in our own medical school.

Revaccination and Medical Examinations.

BEFORE the era of vaccination, smallpox, in claiming its annual toll of deaths, a toll reaching to thousands, showed a marked preference for children. The deaths from smallpox of persons under 5 formed a large proportion of the total fatalities caused by the disease. After vaccination became compulsory, a progressive change in the proportions borne by the smallpox deaths at different periods of life occurred.

The deaths among children decreased in relation to the total deaths at all ages; those among adults *pari passu* increased. After several years of compulsory vaccination had elapsed, the total deaths from smallpox, now to be counted by units, occasionally by hundreds, seldom includes individuals under 5 years of age, unless in unvaccinated children. Still later, as for instance in 1901, the deaths caused by this disease were chiefly in adults over 20 years of age, who had only once been vaccinated in infancy; in those who had never been vaccinated, the percentage of victims under 5 was very much higher than in the once vaccinated, notwithstanding the fact that, as the majority of children are now vaccinated, there are fewer opportunities offered to the unvaccinated children to become infected than in the past. Again, as the total number of vaccinated individuals far exceeds that of the unvaccinated, the fact that the deaths in the former class outnumber those in the latter is subject to the qualification, that the deaths among the latter constituted a much larger proportion of the total unvaccinated population, than the actual deaths of once vaccinated persons did to the total number at risk.

Among the revaccinated, if not less than ten to fourteen days, nor more than five to perhaps seven years from the operation, the records of recent epidemics, as far as they are available, show almost their entire immunity from the disease. It must, however, be kept in mind that the protection conferred by vaccination on one individual can by no means be assumed to be efficient for a definite period of time, nor can the period of efficiency be estimated from the duration of the same in other cases. The only certain proof of the period of protection in any one case is supplied by revaccination. If unnecessary, nothing further occurs; if required, the vaccine "takes." This is especially of importance in youth. Some, then, are particularly susceptible to the *materies morbi* both of vaccinia and of variola. In some, revaccination every two or three years results in more or less severe symptoms on each occasion. The more marked the reaction of the body is in revaccination, the greater the advisability of repeating the operation at short intervals.

To come to the relationship between revaccination, life assurance, and medical examinations for other official purposes. Seeing that primary vaccination is made a *sine quâ non* by almost all, if not all, insurance companies, governmental boards, etc., and that smallpox now rarely attacks nor proves fatal to children, while answerable for a number of deaths, very small compared to the total from all causes, in adults, it is surely only logical to guard against the risk, lessened no doubt by the infantile vaccination, to some extent, to which those over 20 are subjected if attacked by smallpox—a risk almost certainly avoided by the repetition of vaccination—by insisting on proof of such within a certain period beforehand, by granting some small rebatement in insurance cases if revaccination be regularly undergone, by insisting on all officials appointed subjected to medical examination, supplying evidence at regular intervals of having again submitted to the process. The increasing number of those who, from alleged conscientious motives on the part of their parents, or from negligent application of the law, are growing up unvaccinated, behoves all who are not *antis*, nor undervalue the benefit of vaccination, to encourage wider recognition of the value of regularly repeated revaccination.

Last year an instance occurred of the readiness with which immediate danger often induces the laying down of excellent resolutions—resolutions, however, which apply partially, and so are inadequate. The fact that Glasgow at that time was passing through an attack of smallpox led to the adoption of a resolution, to the effect that all who were coming up for a certain medical examination should furnish proof of recent revaccination. The number of persons affected by this was as nothing to the total number in the association, but no request was made to the latter to go and do likewise, although their interests were the same, and their risk as great.

No! if vaccination is requisite before acceptance by an insurance company, or for any official post, revaccination in adults, at any rate, is called for with as much reason; even the regular repetition of the same might form part of the agreement, especially if the person involved has, in the course of his duty or owing to his location, to run special risks of infection from the disease.

ORIGINAL COMMUNICATIONS.

THE HARVEIAN ORATION.

By ROBERT FARQUHARSON of Finzean, M.D., M.P., *President of the Harveian Society of Edinburgh.*

I FEEL deeply the honour of occupying this chair, but I am also seriously, and even painfully, mindful of its responsibilities. On looking down the long list of my predecessors, I find that you have been addressed by distinguished physicians and physiologists and surgeons, who have both claimed and used the right to speak to you with authority concerning Harvey and his work. I cannot pretend to do that, so I set myself a-thinking in what other way I could attempt something to justify your kind confidence. I observe that some of my predecessors have boldly ignored the hero of the evening altogether, and have spent a peaceful half-hour browsing tranquilly in the rich luxuriant pastures of recollection and association. This is always a tempting theme to an old Edinburgh man, more especially to one who, like myself, lived among the giants, and has stored away in the recesses of his brain pleasant and inspiring memories of profitable hours spent in the dingy old class-rooms of dear Alma Mater. For not even Carnegie and all his millions can give us back the keen-knifed and -minded Syme, the eloquent Bennett; Laycock struggling to make clear to our youthful minds the subtle problems of medicine, as yet unillumined by the bright flash-light of experimental research; the sagacious Simpson; Gairdner, Nestor among physicians, and the most philosophic of them all; Begbie, Sanders, Haldane, Spence; Christison, the type of all that was manliest and best in our Scottish character; last, but not least, Goodsir, who, if his too short life had been prolonged, might have taken his place among the immortals, not far from Harvey himself. All this is *magnifique mais ce n'est pas la guerre.* For I have been appointed to a particular bit of work, and I am bound at all events to attempt to fulfil my duty in accordance with the wishes and the usual traditions of those who founded this lectureship.

But, meanwhile, the cold shade of Harvey stands expectant at the door. I think I hear him say, "These memories of the past, so interesting to you and to others, convey no meaning to my mind. Those old well-loved teachers were, no doubt, useful men in their day and generation, and some of them working after my methods have done good and permanent work. I observe that one of your orators has devoted himself to a most interesting analysis of the various references to medical matters in Shakespeare's plays. I knew the Swan of Avon, as I understand you call him, but in those days actors were still looked upon as rogues and vagabonds, and naturally he did not belong to the same set as a court physician like myself; and nothing has surprised me more than to hear of the social position enjoyed by Sir Henry Irving and other leaders of his profession. Bacon, of course, I knew, as I was frequently brought in contact with him as a patient, and other matters, official and political; and I should like to dispel, once for all, the absurd rumour, so closely cherished by some, that he was the real, though not the reputed, author of Shakespeare's plays. And I base my contradiction on this: that I saw them all acted at the Globe Theatre, that the Lord Chancellor never had anything to do with theatrical affairs, and was as incapable of writing a tragedy or a comedy as he was of taking a straight course on public affairs. I am a modest man, and am very reluctant to press my own claims, but I am only down here on a short visit, and much as I should like to hear something about your past worthies, I am still more anxious to hear something about myself, to find out the estimation in which I am held, and then perhaps to go a little further and discover how medical science has progressed, since I sat quiet and speechless, and bade adieu to existence three hundred and forty-seven years ago. Well, in the first place, let me express my cordial gratitude for the more than gratifying appreciation of my work, which I have found both here and elsewhere.

"When I had picked up all the information I wanted here, I got into that to me new and wonderful mode of conveyance, the railway, and instead of jolting along bad roads in a springless waggon, for a series of dreary days, nine hours took me to London; and first, on the call of duty and pleasure combined, I made my way to the old College of Physicians, where I spent so many happy days. The old library, which I built, has vanished, and in its place stands one of the handsomest ornaments of Pall Mall, which I am proud to think my legacy of land helped the President and censors to erect. The Lumleian Lectureship which I held for forty years, and in the course of which I first announced what you call in such flattering terms "my immortal discovery," still continues to provide an honourable prize and a moderate remuneration for some distinguished physician, who now holds it for one year, and is expected to make some original and useful contribution to the sum of human knowledge. The annual oration, the funds for which I provided, was intended by me to perpetuate the name and fame of the various benefactors of the college; and I now learn that it has been devoted exclusively to the glorification of myself, and that nearly 200 unfortunate people have been compelled, for the small fee of £5, subsequently raised to £10, to rack their brains to discover something new and piquant to say about your humble servant.

"Next, I made my way to Bartholomew's Hospital, and I found the place wofully changed. Smithfield, where the martyrs were burnt and cattle used to congregate, has disappeared; and although the entrance to the building is much as it was, and the old hall remains, I see alteration, and I suppose I must call it improvement, on every side. In olden times we obtained with difficulty the bodies of a few executed criminals for anatomical purposes, but now the dissecting-rooms are amply supplied with material, and every student can practically investigate the structure of the entire human body at least once before he takes his qualification. Then I saw physiological rooms filled with a vast variety of mysterious and complicated instruments, the mechanism and uses of which I am quite unable to comprehend; and then I heard of some strange little creatures, microscopic animalcules, who represent in themselves the essence of all our principal diseases, and have reduced pathology to the sweet simplicity of a bacteriological test; and then I made my way to the operating theatre, and saw patients, after a few whiffs of an aromatic gas, fall back insensible on the operating-table, and wake up to find all over, and the healing process begun; and, further, I was told that Lister, the first medical man who has made his way into the House of Peers, following the lead of the equally illustrious Pasteur, has practically abolished the dangers which used to follow with melancholy certainty the use of the knife, and has enabled surgeons to do things which in former times would have meant a sentence of almost inevitable death. I was next fortunate enough to make the acquaintance of Sir Lauder Brunton, who has worked diligently after my methods, tracking out the secrets of nature by experimental research, and he took me round the medical wards, and told me what had been going on since I went to paradise. I have met up there various illustrious men—John Hunter and various presidents of my old college, who have given me some account of the progress, but whether it is the highly rarefied atmosphere or the detachment from their bodily framework, but they had great difficulty in making themselves intelligible, so I thought it was best to slip down to earth to see for myself what progress is doing for the world. My guide first put into my hand a trumpet-shaped piece of wood, which he invited me to apply to the chest of his patients, and I then heard a confused and at first confusing medley of more or less musical murmurs, preceding and following the sounds of the heart, which indicated to the instructed ear the road to diagnosis and the subsequent indications for treatment. He told me that he can now localise, with unfailing accuracy, the functions of various parts of the brain, and remove tumours with wonderful success; that the various fevers are separated from one another, and are fed not bled out of existence; that consumption is now known to be an infectious disorder, like scarlet fever or measles; that stones are crushed and rarely cut out; that aneurysms are cured by tying their feeding artery; that, by the use of digitalis and nitroglycerin, we can brace up the fibres of the heart, and relieve the atrocious sufferings of the breast pang which has extinguished so many bright and shining lights. Finally, that by the ingenious manipulation of scientific methods, we can fulfil the old aspiration of Simpson, and look through and into people, and see what is going on inside as clearly as if the naked body had rendered up its secrets to the pathologist's knife. But my head was now growing confused and giddy. Too much learning would soon make me mad. So I must make my escape while there is yet time, more especially as I know full well the ordeal through which I must pass if I remain. In the first place, I must be received in audience by the King at Marlborough House, most probably have a peerage conferred upon me, which will compel me to take my seat in the Upper House, and make at some period my maiden speech. Next I must be interviewed by every newspaper, and photographed by every lens; you will, of course, invite me to dine with you to-night, and, much as I should enjoy meeting you all, I have always been a modest man, and the opening of the floodgates of praise and adulation would simply sweep me off my mental equilibrium, and circulate my blood with an impetuous energy most destructive to my arterial integrity. So I will now make my grateful and respectful farewell, wishing you a pleasant evening, and a happy meeting at some more or less remote period up aloft."

Harvey having now retired, this would seem a convenient opportunity for saying something about him and his work, his history, his aims, his aspirations, his successes, his failures, if he had any. But three very good reasons stand in the way. First, the inexorable hand of time, which points warningly to the clock, and tells that before long we shall be called upon to toast the immortal memory of the undying anatomist, over the walnuts and the wine. Next comes the irresistible conviction that you devout Harveians, who are now paying me the compliment of such friendly attention, have heard previous orations to such profit, and have studied your subject with such appreciative care, that it is you should teach and I should sit on the learner's bench. And third, and last, comes the difficulty, that at no previous or subsequent period of English history are the personal records of our great men so scanty. What do we know about the inner life of Shakespeare, though the industry of my friend Mr. Sidney Lee has undoubtedly lightened our darkness and told us all that can be known. Bacon has many points of mystery; and the details of Harvey's life are few and scanty. Oh that there were more Boswells about, to devote themselves with patient and self-effacing industry to the congenial task of recording the roars and growls and snarls and tail-waggings of the lion behind whom they were privileged to trot for so many eventful years. Our hero had, at all events, what penny-a-liners call a "sound preliminary education," at least, if the official curriculum of our public schools can be dignified by that high-sounding phrase. And whether a smattering of Latin and Greek, a competent knowledge of cricket and football, a genteel contempt for any one who was not trained at their special institution, and a hopeless incompetency to pass the simplest examination, constitutes a sufficient start of life for our boys, I must leave our educational authorities to wrangle out among themselves. But whatever it was worth, Harvey had years of it, and then went to Caius College, then as now the special home of medicine, where he took his B.A., and acquired sufficient command of Latin to record his researches, after the pedantic manner of the times, in that language rather than his own, which he could use with so much strength and simplicity. His next move was to the then celebrated university of Padua, and where he dissected and worked under Fabricius, whose epoch-making investigation of the valves of the veins forms one of those footprints in the sands of scientific time which led up to his pupil's greater discovery of the circulation of the blood. After five years' steady work, Harvey returned to London, but I can find no record of any systematic period of study there; probably the chances of well-arranged work were not then very great, and I am also unable to find out where Harvey acquired the clinical experience which enabled him successfully to aspire to the post of assistant-physician to St. Bartholomew's—not, I hope, for the sake of his patients, in Italy, where the Sangrado methods, not yet quite extinct, were in full swing, and where, if the unhappy patient had blood enough left in him to carry on the circulation which Harvey described, his lingering convalescence would give him plenty of time to consider whether, in his own case at least, the remedy was not worse than the disease. Promotion soon came in his way: first to the full staff, then to the honourable post of Physician to the King, whom he accompanied to Oxford, and thereby raised protests from the hospital authorities, who not unnaturally thought that he was neglecting his official duties there. He seemed to have enjoyed a large practice, to have been offered the presidentship of the College of Physicians, which age and infirmities compelled him to decline, and, realising a moderate competence, retired from active work, he found himself one day sitting paralysed and speechless in his chair. But, fully retaining all his faculties, he mutely distributed presents to his friends, and quietly passed away from a world whose knowledge and happiness he had done so much to promote. And now again we lament the want of a Boswell, of some one who would have followed Harvey about, noted his manner of life, what he ate, drank, and avoided, and jotted down his table talk, described his practice and his methods, and told us what fees he got. All we know is, that he seemed quite satisfied with £30 a year for his hospital work, that £300 paid him amply for his royal berth, that he made his daily rounds on horseback, like the Dublin doctors of thirty years ago, and that he occasionally performed surgical operations. How different the College of Physicians must have been in those days, for it would be as easy to enter paradise through the eye of a needle as for any physician who handles a knife, save to cut up his roast beef for dinner, to struggle through the portals of Pall Mall to the fellowship of that august if somewhat archaic body. Harvey was deeply imbued with the scientific spirit, working as he had to do under great disadvantages, with no microscope or instruments of precision, and no help in the way of suggestion or scientific aid. His method of working was not unlike Darwin, for he remained for years reflecting and experimenting before he made his discovery public; and although he was fortunate in obtaining immediate recognition and appreciation at home and abroad, his faithful friend, Sir George Ent, did him much the same service as Huxley did for the author of the "Origin of Species," by popularising it in clear language, and holding himself in readiness, armed *cap-à-pie*, to do battle with any who doubted the soundness of his conclusions. Industry was another conspicuous item in Harvey's armamentarium of successful qualities, for not only did he do a great deal of admirable work, much of which was burnt, along with his books and papers, by the anti-Royalists when they took advantage of his absence to rummage through his lodgings at Whitehall, but he was always unhappy when he was not dissecting or experimenting, as he wrote when he was accompanying the young Duke of Lennox on his travels: "By the way we could see scarce a dog, crow, kite, raven, or any bird, or anything to anatomise, only some few miserable people, the relics of the war and the plague, whom famine had made anatomies before we came." Finally, we may point out how supremely he carried out that valuable quality—the scientific use of the imagination, and thus disentangled his subject from the strangling embrace of the crudities and absurdities and superstitions, and almost heathenish and mediæval pseudo-scientific meshes of complication, in which previous observers had left it before he came to unravel, not to cut, the Gordian knot. His predecessors no doubt did something, and on this has been founded the assertion of his enemies, that the discovery was not his own. It has been ascribed to Shakespeare, to various Italians, and not long ago the Chinese Minister gravely, I think, claimed the credit for some of the descendants of Confucius. Probably Harvey mounted to the summit on some steps made by others. But did any great discovery ever spring full-fledged into the world? Sir Humphry Davy, by his researches on laughing gas, paved the way for Simpson; Lister avowedly based asepsis on Pasteur; Jenner found a good working scaffold erected by Chomel and Stokes and Graves and Stewart, and others, before he proved the autonomy of typhus and enteric. Where would Röntgen have been without the previous discovery of Crookes' tubes?

Harvey got little but error from those who went before; and were he here now, I am sure he would gladly and gratefully acknowledge any minute grains of help that he could pick from the confused speculations of Galen, Fabricius, and Columbus.

It would be our duty to fight his battle for him, if it were not already won; and we may now leave him for once to the care of posterity, exhorting the Fellows of this ancient Society, as he left instructions for the exhortation of his own College, that they were "to search out and study the secrets of nature by way of experiment, and also, for the honour of the profession, to continue mutual love and affection among themselves."

OBSERVATIONS ON INTUBATION OF THE LARYNX.

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The following observations are based upon a study of 101 cases that came under either my notice or my care at the Eastern Fever Hospital, Homerton, during the period November 11, 1898, to June 30, 1901.[1] I venture to publish them, because I believe I have obtained some information of a practical value, such as we at the Eastern Hospital would have been glad of when we commenced to intubate. Moreover, since the introduction of the antitoxin treatment (which has greatly enchanced the chances of success in intubation), little has been written on the subject in this country.

Of the 101 cases, in seven intubation followed tracheotomy, and in seven an attempt at intubation failed; so that there were eighty-seven cases of primary intubation.

In forty-three cases intubation alone was needed for the relief of the symptoms; nine of these died, a mortality of 20·9 per cent. In forty-four cases intubation was followed by tracheotomy; fifteen of these were fatal, a mortality of 34·0 per cent.

The *instruments* used were Bayeux's modification of O'Dwyer's, made by Collin of Paris. These tubes are a great improvement upon O'Dwyer's; they are shorter and lighter, and the method of attaching the obturator to the introducer is better in the French than in the American instrument.

I. The Cases in which Intubation alone was performed.—Forty-three, with nine deaths, all cases of diphtheria, except three of simple laryngitis, of which one died. The mortality of the diphtheria cases was therefore 20 per cent. The ages ranged from ten months to seven years. In twenty-nine cases, six being fatal, a single intubation only was necessary; in eleven (two fatal), there were two intubations; and in three (one fatal), three. The length of time during which the tube was worn varied, in the single insertion cases, from four hours to four days; and in the other cases, for the first insertion only, from five minutes to sixty hours. In all the fatal cases relief was afforded by intubation, the cause of death being, for each case, as follows:—

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[1] One case, Case 32, is counted twice, as intubation was performed or attempted on two separate occasions for two distinct reasons.

Case 1.—Cardiac failure, with suppression of urine seven days after removal of the tube; single insertion.

Case 2.—A boy, æt. 1 year, admitted with faucial and nasal diphtheria; subsequently there was broncho-pneumonia, otitis media, and suppuration of the mastoid cells and antrum, which were opened thirty-two days after admission; five days later symptoms of bronchitis and laryngitis arose, with no sign of a relapse of diphtheria; intubation was performed with complete relief, and the tube was removed a few hours later; death took place a few hours after this from failure of the heart, there having been no return of the laryngeal symptoms. No autopsy; case put down, as far as intubation is concerned, as one of laryngitis.

Case 3.—Boy, æt. 6, admitted with faucial and laryngeal diphtheria, and broncho-pneumonia; the latter was the cause of death three days after admission, and thirty-two hours after the tube was taken out for the last time; three insertions.

Case 4.—Chronic nephritis and pericardial effusion, present before the attack of diphtheria; single insertion; tube worn till death, forty-nine hours later. Post-mortem, no membrane in or ulceration of the larynx.

Case 5.—Scarlet fever and cardiac failure, two days after removal of tube; one insertion.

Case 6.—Cardiac failure, eight hours after admission. Boy, æt. 7; severe, toxic case; intubated on admission because of cyanosis, stridor, and recession of thoracic walls; complete relief; tube coughed up five minutes later; return of dyspnœa, reintubation; tube coughed up again ten minutes later, but no return of the dyspnœa.

Case 7.—Cervical cellulitis and heart failure nineteen days after removal of tube; two insertions.

Case 8.—Acute pneumonia, present on admission; intubation soon after admission; tube worn till death, twenty-two hours later; membrane in larynx, trachea and bronchi.

Case 9.—Cardiac failure, five hours after removal of tube; no return of dyspnœa. The patient was a girl, one year old, with severe diphtheria. The tube was removed because dyspnœa, due to blocking of the tube, had set in.

The following are brief notes of some of the most interesting cases:—

Case 10.—Girl, æt. 6; diphtheria; intubation one and a half hours after admission; twelve hours later there was a severe fit of coughing, in which patient brought up a small piece of membrane; several subsequent attacks resulted only in the expectoration of thick mucus; tube removed forty-eight hours after insertion, but had to be reinserted one hour later; thirty-five minutes after this the child coughed up a large piece of membrane, marked by the rings of the trachea; tube finally removed sixty-eight hours later.

CASE 11.—Boy, æt. 2; diphtheria; intubation on admission; fifteen and a half hours later the tube became obstructed and was removed by the nurse; with it came a hollow cylinder of membrane, 1¼ in. long, evidently from the trachea; two hours later the tube had to be reinserted; twelve hours after this there was another attack of dyspnœa and coughing, and the child brought up a second cylindrical cast of membrane from the trachea, 2 in. long; tube finally removed thirty-eight hours later.

CASE 12.—Girl, æt. 6; intubated two hours after admission; tube removed at end of thirty-eight hours; immediately after removal there were several fits of coughing, which resulted in the expectoration of a complete membranous cast of the larynx and upper part of trachea; tube put back fifteen minutes after removal; taken out at end of forty-seven hours, but reinserted in fifteen minutes; finally removed at end of another twenty-five hours.

Besides Cases 9 and 11, there were two others in this group in which the tube had to be removed because of dyspnœa; see Cases 36 and 37, below.

II. THE CASES IN WHICH INTUBATION WAS FOLLOWED BY TRACHEOTOMY.—Forty-four in number, with fifteen deaths. Of these, thirty-seven were cases of diphtheria, with twelve deaths; four of simple laryngitis, with two deaths; and three of measles with laryngitis, with one death. The mortality of the diphtheria cases was 32·4 per cent. The ages of the patients varied from 10 months to 9 years.

The following table shows the cases arranged according to the number of times intubation was performed prior to tracheotomy—

One intubation . .	22	cases	with	6	deaths.
Two ,, . .	9	,,	,,	3	,,
Three ,, . .	3	,,	,,	1	,,
Four ,, . .	5	,,	,,	2	,,
Five ,, . .	1	,,	,,	2	,,
Six ,, . .	2	,,	,,	0	,,
Seven ,, . .	1	,,	,,	0	,,
Eleven ,, . .	1	,,	,,	1	,,

It is instructive to study the reasons of failure of intubation. I find that tracheotomy was performed on seven distinct grounds—

(1) Because no or very partial relief was afforded by intubation, twenty cases with nine deaths; that is to say, the insertion of the tube, whether for the first time or after previous intubations, did not relieve, and in some cases even increased the dyspnœa.

(2) Because several intubations had proved unsuccessful in permanently relieving the patient; in one case there was also

much difficulty in removing the tube; eight cases with four deaths. In these cases, as long as the tube was in the larynx, the patient was comfortable.

(3) Because, some time after removal of the intubation tube, dyspnœa recurred, and the patient's condition quickly became too serious to allow of intubation; eight cases with one death.

(4) Because the intubation tube became suddenly blocked; three cases without a death.

(5) Because the operator attempted another intubation, but failed to insert the intubation tube; three cases with one death.

(6) Because the medical officer called to see the patient had had no experience of intubation, and therefore did not attempt it; one case, which recovered.

(7) Because it was found that the larynx was ulcerated; one case, which recovered.

The following are notes of some of these cases:—

1. Cases in which intubation gave no relief, or increased the dyspnœa—

Case 13.—Boy, æt. 4; simple laryngitis; intubation one hour after admission; tube removed twenty-two hours later; recurrence of dyspnœa three hours later, not relieved by intubation; tracheotomy; considerable difficulty in intubating the second time. Recovery.

Case 14.—Girl, æt. 2; diphtheria; intubated on admission, without relief, so tube taken out at once; the child then coughed up a quantity of mucus; tube reinserted with complete relief; ten hours later the tube had to be removed because it was blocked, but it had to be reinserted at once; during the ensuing twenty hours it became blocked, and had to be taken out four times; on the last occasion reinsertion made the dyspnœa worse, so tracheotomy was done; membrane was removed from the trachea, and some more was coughed up two days later; recovery.

Case 15.—Girl, æt. 4; diphtheria; intubation on admission; tube removed twenty-two hours later; an hour afterwards dyspnœa recurred, but re-intubation aggravated the condition, so tracheotomy was done, and membrane removed from the trachea; recovery.

Case 16.—Boy, æt. 1; simple laryngitis; intubated with some difficulty thirty hours after admission; epiglottis and ary-epiglottidean folds much swollen; tube taken out at end of forty-eight hours, but had to be replaced in forty-five minutes; it went in easily; removed again at end of forty-eight hours; child became dyspnœic at once, and was intubed easily; tube coughed up two or three minutes later, so a larger one was put in; "this tube seemed too large, and I could not get it in properly; while it was still partly in the larynx the child began to breathe badly and got blue; I pulled the tube out, but the child got worse, so I performed tracheotomy; this did not entirely relieve the patient. No membrane was seen"; the child remained more or less dyspnœic till it died, thirty hours later. No cause could be found for the dyspnœa, and an autopsy was not allowed. There was no evidence of diphtheria in the case.

Case 17.—Boy, æt. 5; admitted on May 24, 1900, with measles and laryngitis; intubated at once, and thread left in tube; nearly two hours later the boy managed to pull the tube out; it was reinserted and worn for fifteen hours, when it was coughed up; put in again thirteen hours later; worn for forty hours, and then removed. The child remained quite comfortable for a week, when he was seized at 10.30 p.m. suddenly with symptoms of laryngeal obstruction; he was intubated, but coughed the tube up three hours later; soon afterwards he was twice intubated, but coughed the tube up on each occasion; once more the tube was inserted, but this time there was only partial relief, and, as the patient got worse, tracheotomy was performed. The subsequent history of this case, though interesting, is too long to be told here. Suffice to say that the boy never succeeded in doing without the tracheotomy tube, nor could the cause of this be ascertained. He was examined under an anæsthetic by a laryngologist at one of the large London hospitals some months later, but the larynx and trachea were found to be quite clear.

Case 18.—Boy, æt. 4; diphtheria; intubated on admission; tube inserted without any difficulty; satisfactory respiration soon followed; the child sat up and said he was better; he then took a deep inspiration as if about to cough, but no expiration followed; the patient rapidly became cyanosed and the pupils dilated, so that tracheotomy had to be done at once, the intubation tube remaining in the larynx; a good deal of membrane was coughed up, including a cast of the lower part of the larynx and the upper part of the trachea; more membrane was coughed up during the subsequent four days; recovery.

In twelve of these cases, tracheotomy followed a single intubation; in the remaining eight there were two or more intubations.

Of the twenty cases, seventeen were diphtheria; in thirteen it was definitely ascertained that membrane was present in the trachea.

2. Cases in which several intubations failed to relieve—

Case 19.—Boy, æt. 2; simple laryngitis; intubation on admission; tube removed at end of forty-one hours; re-intubation seven hours later, after several unsuccessful attempts; much swelling of larynx, so that a smaller tube was inserted; this was coughed up after four hours; intubation again two hours later; tube removed at end of thirty-six hours; reinserted three hours later, and worn for forty-six hours; taken out and found to be much discoloured; half-an-hour afterwards the tube was put in again; there was more difficulty in getting it in than before, and there was more swelling of the larynx; the tube was coughed up at the end of forty-nine hours, and as the dyspnœa at once returned, tracheotomy was performed. This was followed by considerable surgical emphysema. The patient died next day. Only the larynx and adjoining parts were examined post-mortem. "There was extensive emphysema round the tracheotomy wound, extending down to the chest and axillæ and up to the neck on each side. On opening the larynx, there were found five distinct ulcers. The two largest were situated over the lower and posterior parts of the thyroid cartilage, one on each side. Each was somewhat triangular in shape, with a base posteriorly, where, in fact, the ulcers joined one another to a certain extent. These ulcers were deep, and exposed the cartilage. A third, also exposing cartilage, was in front, midway between the two first. A fourth, shallower, also in front, rather more than $\frac{1}{8}$ of an inch above the vocal cords. The fifth was below, opposite the cricoid cartilage, and was irregular and diamond shaped, exposing cartilage in one place. The tracheotomy wound, in its upper end, had cut through this ulcer."

Case 20.—Girl, æt. 1; diphtheria; intubated eleven times during several days; as the tube was constantly being coughed up, tracheotomy was performed; the tube was taken out (and not replaced) at the end of sixty hours; there was no more dyspnœa; death took place two hours later from syncope. The case was a severe toxic one. There was discoloration of the intubation tube. On every occasion intubation was very easy in this case. A post-mortem examination revealed irregular ulceration, especially at base of epiglottis, on right vocal cord, and over the middle of the thyroid cartilage; at the latter place it extended nearly all round the larynx. There was also a small ulcer just above the tracheotomy wound, which divided the second to fourth rings of the trachea. Nothing abnormal in the lungs.

Case 21.—Boy, æt. 2; diphtheria; intubated three and a half hours after admission; tube removed twenty-three hours later, discoloured; reinserted six hours afterwards and worn for two days; removed and found to be discoloured; put in again about fifteen hours later; taken out much blackened at end of thirty-five hours; the child got worse, and was tracheotomised soon afterwards. This was on July 19, six days after admission. Subsequently the child was never able to do without the tube for any length of time. On August 11, intubation was attempted without success, the glottis being found to be narrowed. On September 7 the glottis was almost impermeable, but was dilated and an intubation tube inserted. This tube, however, was coughed up, and could not be retained in the larynx, so that it was left out and a tracheotomy tube put in again. On December 16 there was a relapse of diphtheria. which proved fatal six days later. At the post-mortem examination it was seen that the larynx was completely occluded by a firm, thick cartilaginous mass, commencing about half an inch below the cords and extending down to the tracheotomy wound. There were what looked like two old shallow ulcers just above the false cords, and above them some loss of substance or erosion of the base of the epiglottis.

Case 22.—Girl, æt. 4; diphtheria; intubated four times; much difficulty was experienced in removing the tube after the last insertion, and chloroform had to be given; consequently, as the patient became worse, tracheotomy was performed; recovery.

Case 23.—Girl, æt. 1; simple laryngitis; intubated six times without difficulty; tube coughed up three times; tracheotomy; recovery.

Of the eight cases in this group, six were diphtheria, and in not one of them was there any membrane removed or coughed up from the trachea.

3. There is nothing special to relate of these cases; they were

all diphtheria; in only two of the eight was membrane obtained from the trachea.

4. Cases in which the intubation tube became suddenly blocked—

CASE 24.—Boy, æt. 2; diphtheria; intubated on admission; twenty-two and a half hours later there was a fit of coughing, and the child was rapidly becoming suffocated; the nurse pulled out the tube by the thread which had been left attached, but without relief; the medical officer then arrived, and did tracheotomy; several large scraps of membrane were removed from the trachea; recovery.

CASE 25.—Boy, æt. 3; diphtheria; intubated nineteen and a half hours after admission; thirteen and a half hours later, the child's breathing not having been satisfactory for five or six hours, there was an attack of coughing followed by impending suffocation; tracheotomy was performed, and a firm, tough, coiled up piece of membrane extracted from the trachea; recovery.

CASE 26.—Girl, æt. 4; diphtheria; intubation six hours after admission; twenty-six and a half hours later the child became dyspnœic and cyanosed; the tube was taken out, but without relief; tracheotomy, but no membrane found; recovery.

In none of these cases was there membrane in the intubation tube itself; when membrane was found, it was in the trachea just below the tube.

5. In the fatal case in this group, death was due to broncho-pneumonia, and occurred four days after tracheotomy. In one of the other two cases (Case 27), a girl, æt. 4, suffering from diphtheria, so much difficulty had been experienced in inserting the tube on the first occasion, that when operative measures were required a second time, tracheotomy was chosen. Strictly speaking, therefore, there was no failure in this case. The patient recovered. In one of the two diphtheria cases, membrane was removed from the trachea at the operation.

6. This case requires no comment.

7. The only case (Case 28) in this group was a boy, æt. 6, admitted for diphtheria, and intubated at once; tube removed at end of ninety-one hours, but reinserted twenty minutes later; taken out again ninety-five hours afterwards; at first, the child was quite comfortable, but gradually laryngeal symptoms returned, and a week after the tube had been discarded, a laryngoscopic examination revealed ulceration of the posterior part of each vocal cord. Tracheotomy was performed, and the boy made a good recovery.

III. THE CASES IN WHICH THE ATTEMPT AT INTUBATION WAS NOT SUCCESSFUL.—Seven in number: four cases of diphtheria; two of simple laryngitis; and one case in which there was a difficulty in getting the patient to do without a tracheotomy tube (Case 32, below). Two of the diphtheria cases died, one five days later of cardiac failure (for the other, see Case 30, below).

1. Want of experience is doubtless one of the causes of want of success; and of eleven cases in which failure was encountered, either with primary or secondary intubations, eight occurred within eight months of the introduction of this measure at the Eastern Hospital; but other causes are—

2. Spasm of the glottis; thus in Case 29, one of the successful intubations, a boy, æt. 2, with diphtheria, an unsuccessful attempt at introducing the tube was at once rendered successful by giving the patient a little chloroform.

3. Œdema of the glottis, or sometimes the epiglottis only.

4. The preliminary gagging, which very occasionally aggravates the respiratory distress.

Case 30.—This case has already been published elsewhere.[1] I therefore relate it in the words of the operator: "A girl, æt. 2, was admitted to the hospital with membrane on the uvula and tonsils, with stridor and retraction of the chest walls. She could not make any crying noise, and the cough was very stifled. I inserted the gag without any difficulty, but the child struggled for a few moments, when the breathing suddenly ceased. The eyes were suffused, the neck vessels were turgid, and the face was cyanosed. I opened the trachea instantly; artificial respiration and the usual restoratives were persisted in for a long time, but despite all efforts the patient died."

In another case (Case 31), a different operator states in the notes: "In attempting intubation the child stubbornly resisted the gag; before one attempt could be completed, respiration stopped." Tracheotomy was instantly performed, and the patient, a boy, æt. 2, suffering from diphtheria, made a good recovery. Apparently, it is not so much the gag as the struggling to resist its introduction that leads to distress.

5. Blocking of the larynx by mucus, etc., during attempt to intubate (see Case 32, below).

Of the five medical officers concerned with these cases, each had his experience of failure.

IV. The Cases in which Intubation followed Tracheotomy.—Seven in number. In six of them there was a difficulty in getting the patient to do without the tracheotomy tube, and intubation was practised as a means towards its final removal; and as such proved of value. It is not necessary, however, to say anything more about these cases here, except that in one of them (Case 32) I failed on a second occasion to insert the tube; there was urgent dyspnœa, and an excessive secretion of mucus and saliva blocked the larynx before I could get the tube properly into its place, and I had to perform tracheotomy at once.

The sixth case (Case 33) was a boy, æt. 1, with laryngeal diphtheria, who had been tracheotomised at another hospital three hours prior to admission to the Eastern Hospital; nine hours after admission the breathing became unsatisfactory, the tracheotomy tube was removed, and some membrane extracted from the trachea; an intubation tube was then put in, but dyspnœa occurring four hours later, it had to be taken out and the tracheotomy tube inserted; five days later this was altogether omitted, and the child made a good recovery.

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[1] Basan, *Lancet*, London, July 13, 1901.

When first practising intubation, there are several questions that arise in the mind of the operator, answers to which can be obtained only by experience. I will attempt to solve these questions with the aid of the present series of cases.

1. *What sort of cases are eligible for intubation?*—(*a*) As between cases which are diphtheria and those which are not (chiefly measles and simple laryngitis); and (*b*) as between cases of diphtheria of different degrees of severity, etc.

(*a*) I was myself much inclined to think, before I had any experience of intubation, that cases of laryngeal obstruction due to simple laryngitis or measles would prove more amenable to treatment by intubation than would cases of laryngeal diphtheria. For one thing, the constitutional symptoms are less severe; and, for another, there is no false membrane in the larynx or trachea. But the facts do not support this *a priori* reasoning. Of the ninety-four cases in which intubation was attempted or accomplished, thirteen were not cases of diphtheria; nine being cases of simple laryngitis, three of measles, and the thirteenth being Case 32 given above. Setting aside Case 32 (in which intubation was proposed as a means of getting rid of the tracheotomy tube), we have ninety-three cases of primary laryngeal obstruction, of which eighty-one were cases of diphtheria, and twelve of non-diphtherial laryngitis. Of the eighty-one diphtheria cases, forty came to tracheotomy, or 51·2 per cent.; while of the twelve other cases, ten, or 83·3 per cent., came to tracheotomy. Though the number of these cases is small, yet as far as they go the figures point to the inadvisability of at any rate persisting in the intubation of cases of this nature. On referring to the notes, I find that in the non-diphtherial cases, as long as the tube is retained, the patient's breathing is comfortable; but that the tube is apt to be frequently expelled by coughing, and when either coughed out or purposely removed, dyspnœa very speedily returns. Frequent coughing up of the tube means an irritable condition of the larynx. Curiously enough, in those cases of diphtheria in which frequent expulsion of the tube has occurred, there has been no certain evidence of the presence of membrane in the larynx or trachea.

(*b*) In an article on "Diphtheria"[1] I wrote as follows: "Intubation is inadmissible in two classes of cases, those in which the patients, when brought for treatment, are *in extremis* from suffocation, and those where there is very abundant faucial membrane. It is inexpedient in toxic cases in which there is little or no hope of the patient's recovery." I should now modify this statement as regards the cases with very abundant faucial membrane, which, after more experience, I do not think are necessarily excluded from the benefits of intubation, provided that there are no symptoms of profound toxæmia, and that there is no œdema of the fauces to obstruct the upper opening of the tube *in situ*. A little later in the same article I say: "If there is evidence of extension of membrane below the larynx, tracheotomy is to be preferred to intubation. It is stated by some writers that membrane is coughed up through the intubation tube; but the writer has never met with such a case. None of the cases he has had under observation, in which there was membrane below the larynx, have done well with intubation, but have come sooner or later to tracheotomy." An enlarged experience has shown me that membrane below the larynx is not necessarily a bar to intubation. As a matter of fact, it is very rarely that the presence of membrane in the trachea is ascertained before intubation or tracheotomy is performed; so that practically every case of this kind, in which there is no other objection to intubation, would undergo intubation, where that operation is systematically practised. That membrane can be coughed up through the tube, is shown by Cases 10 and 11, though these are the only two such cases in this series. Of the forty cases of diphtheria in which intubation alone was needed, in six, two being fatal, membrane had formed in the trachea. On the other hand, in eighteen (five being fatal) of the thirty-seven diphtheria cases that came to tracheotomy, membrane was found in the trachea.

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[1] "Ency. Medica," vol. iii.

2. *How long should the tube be allowed to remain in the larynx?*—With a view to obtaining information on this point, I have drawn up the following tables:—

Intubations alone (omitting two cases in which the tube was worn till death, Cases 4 and 8, above).

Time during which Tube remained in Larynx.						
Under 12 hours,	10 cases,	of which	5	had to be	re-intubated	(2 twice).
12 to 24 ,,	3	,,	1	,,	,,	
24 ,, 36 ,,	4	,,	2	,,	,,	
36 ,, 48 ,,	15	,,	4	,,	,,	(1 twice).
48 ,, 60 ,,	6	,,	1	,,	,,	
60 and over	3	,,	1	,,	,,	
	41		14			

Intubations followed by Tracheotomy.

Time during which Tube remained in Larynx.				
Under 12 hours,	23 cases,	of which	9	were re-intubated.
12 to 24 ,,	8	,,	5	,,
24 ,, 36 ,,	1	,,	0	,,
36 ,, 48 ,,	3	,,	2	,,
48 ,, 60 ,,	4	,,	4	,,
60 and over	5	,,	2	,,
	44		22	

The cases in which the tube remained in the larynx less than twenty-four hours include sixteen in which it was coughed up or pulled out by the patient,[1] and most of those in which sudden blocking took place. But the figures, especially those of the first table, point to the advisability of not removing the tube till the lapse of from thirty-six to sixty hours. Occasionally a very short stay of the tube in the larynx is sufficient to effect a cure. Thus in Case 29 the patient pulled the tube out four hours after it had been inserted, remained quite comfortable, and required no further treatment. Again, in another case, Case 34, a boy, æt. 6, with diphtheria, the tube was coughed up six hours after intubation. There was no occasion to reinsert it, and the patient made a good recovery. But such cases are not common.

3. *How many insertions of the intubation tube should be made before resort is had to tracheotomy?*—Every case that was intubated four or more times came to tracheotomy. I therefore lay down the rule that if three insertions, each of several hours' duration, fail to cure the laryngeal obstruction, tracheotomy should be performed.

Frequent expulsion of the tube by coughing a few minutes after its insertion is also an indication for tracheotomy.

4. *Is any importance to be attached to the blackening of the tube that is not infrequently observed?*—Discoloration or blackening of the tube occurred in six (one fatal) of the forty-three intubation cases, and in nine (five fatal) of the forty-four intubation cases that came to tracheotomy, while it occurred in all the cases in which ulceration of the larynx was known to have taken place (Cases 19, 20, 21, and 28). On the other hand, it also occurred in Case 4, in which death was due to chronic nephritis and pericardial effusion. In this case the tube was worn for forty-nine hours, and was in the larynx at the time of death. It was blackened, but an autopsy proved that there was neither ulceration of nor membrane in the larynx or trachea. In another case of diphtheria which was cured by a single intubation of twenty-four hours' duration, the tube was coughed up and found to be discoloured; but the patient got well without further dyspnœa. I have known a tube to become blackened after having been only ten hours in the larynx for the first time. Discoloration of the tube, therefore, does not necessarily mean ulceration; and I am not disposed to attach any importance to it.

Lastly, I will consider, in the light of these cases, certain objections that have been raised against intubation as an alternative to tracheotomy.

(*a*) *The danger of sudden blocking of the tube while in the larynx by membrane or thick mucus.*—This occurred seven times amongst the forty-four cases that came to tracheotomy; but in only three instances was immediate tracheotomy needful. In two of these three cases membrane was found in the trachea. In one of the remaining four cases the tube became blocked on no fewer than five occasions (see Case 14, above). In another instance, Case 35, a girl, æt. 6, the tube became blocked with mucus eight hours after it had been put in. It was instantly removed, and the child remained quite comfortable. Four hours later, however, urgent dyspnœa set in, necessitating tracheotomy. Membrane was found in the trachea, but the patient made an excellent recovery.

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[1] In four instances only out of all the intubations did the patient pull the tube out, as we usually remove the silk or thread.

Sudden blocking also occurred in four of the forty-three cases in which intubation alone was performed. In only one of these was membrane in the trachea (see Case 11). The three other cases were as follows:—

Case 36.—Girl, æt. 5, with diphtheria. Forty hours after the child had been intubated, the tube had to be taken out because of sudden and urgent dyspnœa; the patient then remained comfortable for twenty-four hours, when a return of dyspnœa necessitated re-intubation. The tube was worn for four days; no further insertion was required, and the patient was soon well.

Case 37.—Girl, æt. 3, with diphtheria following measles. Fifteen minutes after intubation the tube was coughed up, and it was not necessary to reinsert it till ten hours later. After another ten hours the tube had to be removed by the nurse because there were signs of its being blocked. Re-intubation eleven hours later; tube worn for forty-five hours, then removed; and child recovered.

The other case was Case 9, related above.

Thus, in eighty-seven cases of intubation for primary laryngeal obstruction, sudden blocking of the tube occurred in eleven instances, 12·6 per cent. In three cases tracheotomy was required at once, and in four it had to be performed at a later period. These eleven all occurred amongst the diphtheria cases, seventy-seven in number, an incidence of 14·2 per cent. But amongst these cases there has not been one in which death was due, even remotely, to sudden blocking of the tube. In hospital practice there appears always to be time for a medical man to reach the patient early enough to remove the tube, and, if needful, open the trachea successfully. Moreover, an intelligent nurse can be taught to "express" (or "enucleate")[1] the tube, when (as I believe to be the best course) the thread is removed after the tube is comfortably in the larynx.

In hospital practice, therefore, where there is always a resident medical officer at hand in case of need, the objection to intubation on the score of sudden blocking of the tube is not sustained.

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[1] For an account of this method of removing the tube, see Report for 1898 of Statistical Committee of the Metropolitan Asylums Board, Medical Supplement, p. 187.

(β) *The risk of causing ulceration of the larynx.*—The four cases in which this complication occurred have been related above (Cases 19, 20, 21, and 28). In Case 19, intubation was difficult on the second occasion on which it was done, most probably on account of the swollen condition of the larynx. There can be little doubt that it was wrong to persist in intubation after it was found that the organ had become so swollen as to necessitate the use of a smaller tube. In Case 20 there was evidence of extreme irritability of the larynx, as the tube was expelled by coughing no fewer than eight times within a comparatively short period. Here, again, intubation should have given way to tracheotomy at an earlier date. The only fault I can find with Case 28 is, that the tube was allowed to remain in the larynx for two very long periods, ninety-one and ninety-five hours. These three cases occurred within three months of November 11, 1898, when our experience was still somewhat limited. Case 21, however, happened upwards of nineteen months after this date; and there was no excess either in the number or duration of the intubations. I assume that there was ulceration preceding the occlusion of the larynx, and that the latter was not due to granulations sprouting upwards from the tracheotomy wound and becoming organised into fibrous tissue. But it is quite possible that, after all, intubation may have had nothing to do with the subsequent stricture. Ulceration and constriction of the larynx have been known to follow tracheotomy, even in diphtheria, quite apart from the use of intubation tubes. I have known three such cases—two after diphtheria, and one after scarlet fever.

Be very careful in the introduction of the tube. Do not intubate when the larynx is much swollen; a fact which can often, if not always, be ascertained with the finger. If in any case intubation is found to be difficult, do not persist too much in your efforts, especially if your experience of the operation is limited. Lastly, do not intubate the same case more than three times. If these rules are adhered to, I believe that ulceration of the larynx will occur no more often after intubation than it does after tracheotomy.

(γ) *The danger of increasing the dyspnœa by pushing false membrane before the tube.*—Certainly this does occur; but the operator has only to withdraw the tube, and, if necessary, perform tracheotomy. Intubation should never be attempted without all the apparatus for tracheotomy being ready at hand. It is also unwise for any one to undertake intubation who has no, or very little, experience of tracheotomy, or unless some one with that experience is present; for this operation, under these circumstances, may require rapid execution.

(δ) *The tube may be coughed up and the dyspnœa return.*—This is perfectly true. I find that intubation was practised 164 times upon the eighty-seven patients dealt with in sections I. and II., and the tube was either coughed up or pulled out by the patient on forty-six occasions, 28·0 per cent. Dyspnœa by no means always returns at once, and when it does there is ample time for the medical officer to reach the patient and reinsert the tube or perform tracheotomy, as the case may demand. Intubation cases doubtless require the medical officer to be more at their beck and call than do tracheotomy cases; but this cannot be claimed as a serious objection. It is very rarely that the tube, after being coughed up, is swallowed by the patient; and when this does occur it can always be recovered.

(ε) *That intubation is more difficult to perform than tracheotomy.*—This is not my opinion. I can hardly believe the objection would be put forward by any surgeon who has given intubation a fair trial. I have witnessed as much bungling over first performances of tracheotomy as of intubation. Tracheotomy is an operation so often performed now-a-days that one hears little of its accidents. I take leave to doubt whether the dangers and difficulties of the one operation are more serious than those of the other. For instance, the risk of the anæsthetic, so often necessary in tracheotomy, is certainly greater than that of the gag in intubation. Moreover, intubation has this advantage over tracheotomy, that it can be practised on the cadaver with much advantage to the student.

(ζ) *That the patient is prevented from taking sufficient nourishment.*—It is true that the patient cannot take food in the ordinary way without danger of its getting into the larynx. But ample nutriment can be given either by a tube passed through the nose into the stomach, or by rectal feeding. The child may be allowed occasional sips of water by the mouth. This not only prevents the mouth from getting dry, but also, as has been pointed out by Basan,[1] excites coughing, which helps to keep the tube clear of mucus.

In considering the question of intubation *versus* tracheotomy, it is to be remembered that the former is not prejudicial to a subsequent performance of the latter, as is shown by the low mortality (34 per cent.) of those cases which after all had to be submitted to tracheotomy (section II.).

Before concluding, I have only to add that, for reasons into which I need not enter, not every case that might have been suitable for intubation has been so treated during the period taken. On the other hand, no case has been intubated that would not otherwise have been submitted to tracheotomy. This is shown to a considerable extent by the following figures, which refer to the period in question:—Of 440 cases of croup in diphtheria, in forty intubation alone was performed, in thirty-seven intubation was followed by tracheotomy, in 147 there was tracheotomy without previous intubation, and in 216, or nearly half the total cases, no operation of any kind was necessary, the laryngeal obstruction not being sufficiently urgent. I need hardly say that all the cases were treated with antitoxin, without which results so successful would not have been obtained.

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[1] *Lancet*, July 13, 1901, p. 76. Dr. Basan's paper deals with some of the cases included in my series of 101.

For the notes of the cases I am indebted to Drs. Woollacott, Williams, Bolton, and especially Basan (who had to do with most of them), the assistant medical officers.

POST-OPERATIVE HÆMATEMESIS, WITH NOTES OF ELEVEN CASES.

By ROBERT PURVES, M.B., F.R.C.S.Ed., *Tutor in Clinical Surgery University of Edinburgh, and Assistant-Surgeon Deaconess Hospital.*

ATTENTION was at first directed to the occurrence of post-operative hæmatemesis by von Eiselsberg, who recorded eight cases at the German Surgical Congress of 1899. Of thirty-seven cases since recorded, I have obtained some particulars in twenty-nine. Twenty-four followed abdominal operations—including, hernia (eight cases), gall-bladder (three cases), appendicitis (six cases); also after ovariotomy, tuberculous peritonitis, intestinal obstruction, exploration for stab of abdomen, and exploratory incision in the iliac fossa. Of the five other cases, two followed excision of the rectum; one, suprapubic lithotomy; and one, removal of cancer of the palate. Hæmatemesis has also followed infection of the urinary tract. The following eleven cases have been collected from the wards of the Royal Infirmary, and for permission to report them I am indebted to the courtesy of Professors Annandale and Chiene and Dr. MacGillivray.

CASE 1.—Mrs. K., æt. 53 (Prof. A.), had an umbilical hernia for twelve years, which gave rise to periodic attacks of pain, vomiting, and constipation; no vomiting at present. Previous history was negative.—*Operation, September* 9, 1901.—The sac contained a large loop of small intestine and a considerable mass of adherent omentum. During the operation the bowel was perforated; little or no escape of contents occurred, and the opening was at once sutured; part of the omentum was removed. There was no chloroform sickness. The first hæmatemesis occurred thirty hours after operation, when she suddenly vomited a large quantity of coffee-ground fluid. This was accompanied by intense pain in the hypogastrium. Thirty-six hours after the operation, hæmatemesis was repeated and continued at short intervals until death, which occurred three hours later. Before death she became delirious, and had severe abdominal pain. Pulse was very fast, and her respirations were thoracic. There was no sectio, but the probability of sepsis was considerable.

Case 2.—Fred. C., æt. 67 (Prof. A.), had suffered from symptoms of stone in the bladder for three months. The urine was healthy. Has never had any gastric trouble.—*Operation, October* 18, 1900.—Uric acid stone crushed and removed. There was no chloroform sickness. Three hours after the operation he vomited a small quantity of coffee-ground fluid. No pain and no severe retching. During the next day there was some pain over the epigastrium, relieved by fomentation; was better on the following day. No pus in the urine, and no pain. Sixty hours after the operation he became collapsed, and vomited 10 oz. of black fluid. Pulse was intermittent and there was some tympanites. He rallied under strychnine, strophanthus, and washing out of the stomach with hot water, but collapsed again, and died without vomiting five hours later. It was not certain that sepsis was present, but his general condition and the tympanites made it very probable.

Case 3.—Mrs. L., æt. 38 (Prof. A.), had for nine months suffered from periodic attacks of pain in the right side, with slight jaundice; of late more frequent and severe. The day before operation she had a severe attack, vomited and became jaundiced. Has never had any gastric trouble. Diagnosis was gall stones; and on October 27, 1900, the gall bladder and ducts were explored, but with negative result. A hard swelling was found occupying the head of the pancreas. It was believed to be malignant, and the abdomen was closed. (The pylorus was examined by invaginating the stomach wall.) There was no $CHCl_3$ sickness, and progress was uneventful until the ninth day, then deep-seated colicky pain commenced in the right hypochondrium. In the evening she fainted and collapsed, cold sweat and ice-cold hands and feet. Wound appeared healthy. The following day she vomited bilious fluid continuously, which toward evening became grumous and dark (ten days after operation). The hæmatemesis continued off and on for the next twelve hours, then ceased, and she improved. Seven days later she again collapsed, vomited between one and two pints of black fluid, and died in half an hour. The sectio revealed an abscess which replaced the whole of the pancreas, no malignant disease; the biliary passages and peritoneum were healthy. Stomach and liver showed no change. The omentum shows areas of fat necrosis.

Case 4.—Peter C., æt. 50 (Prof. A.), had suffered from renal colic for eleven years. Has twice passed a stone. Symptoms referred chiefly to the right side, but at times to the left. Urine non-purulent. X-ray showed three stones in right kidney. No history of gastric trouble.—*Operation, February* 20, 1901.—Lumbar incision. Kidney a mere shell full of stones. Stones removed and wound drained. No chloroform sickness, but was very restless. First hæmatemesis occurred eighteen hours after operation; without warning he vomited three pints of black grumous fluid. Hæmatemesis continued in small mouthfuls all day. Treatment by ice, ergot, and stimulants was unavailing, and he died thirty-six hours after the operation. Sectio showed some pus in the pockets of the right kidney. Tuberculous peritonitis and nodules in spleen and liver; no necrosis on section. Stomach and duodenum showed nothing.

Case 5.—Hugh C., æt. 43 (Mr. MacG.), had a right reducible inguinal hernia for some years. No record of previous history.—*Operation, November* 17, 1896.—Radical cure of hernia. Omentum probably not removed. Wound became septic. $CHCl_3$ sickness was not noted. The first hæmatemesis occurred seven days after operation, when, in the course of the afternoon, he vomited clots of dark blood, in all three times. He subsequently vomited bilious fluid. Was slightly collapsed for some hours after the hæmatemesis. There was no return of hæmatemesis, and recovery was complete.

Case 6.—James M'N., æt. 32 (Mr. MacG.), had a right inguinal hernia for twelve years, irreducible of late years. Has never had gastric trouble.—*Operation, May* 3, 1901.—Sac contained cæcum and appendix; there were many adhesions. The appendix was removed, but no omentum. Chloroform sickness commenced immediately after operation. The first hæmatemesis occurred three hours later, gradually replacing the bilious vomit. Continued for half an hour in small quantities. Six hours later, he twice vomited a few ounces of grumous fluid. During the next two days was sick at intervals, but the vomit was free from blood. Temperature rose gradually to 101°, and on the fifth day profuse sero-sanguineous discharge took place from the wound. On the sixth day the temperature fell, but he coughed up mucus streaked with blood. No physical signs were found in the lungs, and the hæmoptysis did not recur. Discharge from the wound ceased, but the temperature rose again, and on the fourteenth day the wound became red and tender. A considerable quantity of dark blood clot was evacuated, but no pus. Blood oozed freely for some days, then gradually ceased. The temperature fell, but on the thirty-second day rose again, due to the presence of a deep-seated abscess at the upper part of the wound. This was evacuated. His subsequent progress was satisfactory.

Case 7.—David T., æt. 62 (Prof. C.), had symptoms of vesical calculus for three years, latterly some cystitis, never any blood. Urine was purulent. No history of gastric trouble. Suprapubic lithotomy was performed on January 27, 1893, and the bladder drained. He struggled violently during anæsthesia, and $CHCl_3$ sickness commenced early. It continued all day and night at intervals, and less frequently on the following day; was checked by bromide and hot coffee. During the next night he twice vomited bilious fluid. The first hæmatemesis took place next morning, forty-six hours after operation, a large quantity of clotted blood. In half an hour, again vomited a small quantity of clots. Rectal feeding was adopted and ergot given, but five hours later he vomited grumous fluid, and died fifty-four hours after operation. It was concluded that an atheromatous vessel had ruptured. The sectio showed extensive atheroma. The stomach and upper part of small intestine contained dark blood. There were two old ulcers on the lesser curvature of the stomach. An arterial branch close to an ulcer had a clot in it discoloured by the stomach contents, but no perforation into the vessel could be established. There was calculous pyelitis of the right kidney.

Case 8.—Mrs. K., æt. 56 (Prof. A.), had gall-stone colic of five years' duration, and three years ago passed a stone. Attacks have been increasing in frequency, and she now has cholecystitis. No history of gastric trouble. Stones removed from gall bladder and cystic duct on

June 14, 1901. Bile in gall bladder clear, but lining membrane velvety and hyperæmic. A small piece of omentum was removed. Fistula established. There was no $CHCl_3$ sickness. The first hæmatemesis occurred thirty-six hours after operation, 2 oz. of grumous fluid being suddenly vomited. Twelve hours later, again vomited a small quantity of dark fluid, and continued bringing up mouthfuls of similar fluid at intervals of half an hour. Rectal feeding and lavage of the stomach gave temporary relief. A repetition with very hot water gave relief for eight hours, but seventy hours after operation the hæmatemesis returned, and continued at intervals, unchecked by treatment, until her death on the seventh day. There was no sectio, but the slight elevation of temperature, quick pulse, and general condition appeared to justify the conclusion that a general infection had taken place from the infected gall bladder.

Case 9.—Mrs. D., æt. 27 (Mr. MacG.).—Had her ovaries removed twelve months ago for persistent uterine hæmorrhage. The bleeding was cured, but she acquired a ventral hernia. No history of gastric trouble.—*Operation on June* 25, 1901, at which omentum was found adherent to the scar; part was removed. $CHCl_3$ sickness was severe, and was succeeded by hæmatemesis six hours after the operation. During a period of one and a half hours she twice vomited black grumous fluid, 3 oz. in all. Vomiting ceased until midnight. During the following twelve hours she vomited bilious fluid (free from blood) three or four times.

Case 10.—Woman, æt. 40 (Prof. A.).—A case of uterine fibroids, for which abdominal hysterectomy was performed. There were many adhesions; no omentum was removed. Abdomen was closed. $CHCl_3$ sickness was slight all day, more severe in the evening; patient very weak, and little or no effort was made in vomiting. Became a passive regurgitation, which continued off and on until it was succeeded twenty-four hours after operation by the first hæmatemesis. Small quantities of black fluid were brought up at intervals. The amount and frequency increased, and she died forty-eight hours after the operation. Temperature was subnormal, pulse quick, pain was absent, also tympanites, but she was preternaturally acute, and restless up to the hour of her death.

Case 11.—Man, æt. 27 (Prof. A.).—Two uric acid calculi were removed from the right kidney. $CHCl_3$ sickness, slight at first, and occurring at long intervals, increased in frequency on the following day. During the next twenty-four hours vomiting continued, more violent and in greater quantity. Forty hours after operation, black fluid containing blood replaced the bilious vomit, and continued till death, fifty-two hours after operation, and twelve hours after onset of hæmatemesis. Temperature was subnormal, pulse rapid, very restless, perspiring, and he complained latterly of abdominal pain.

Reference to the cases reported here and elsewhere render it at once apparent that the advent of hæmatemesis after operation is a serious complication. The mortality is high, eight of the eleven cases having ended fatally, a death-rate of 72·5 per cent.; and of twenty-nine cases, already recorded, 69 per cent. died. Age apparently is of no moment, the cases reported here occurring in individuals whose ages varied from 24 to 67. The incidence of hæmatemesis is, moreover, not associated with any particular form of operation. In the majority of instances it has followed operations in relation to the abdomen. But, on the other hand, I have been informed of two cases in which it followed amputation through the thigh, and the removal of a neuroma in an amputation stump; and, as a rule, there is no history of previous gastric symptoms or vomiting of blood.

The mode of onset of the hæmatemesis.—Chloroform sickness may or may not precede the hæmatemesis, and in only a few cases can be held responsible for initiating the bleeding. In those cases in which vomiting after the anæsthetic is present, it appears more usual for the hæmatemesis to gradually supervene, the more or less frequent bilious vomiting continuing for a variable period until the appearance of blood. The bilious vomiting in many cases becomes less violent before the onset of hæmatemesis, and sometimes becomes a mere passive regurgitation, the fluid welling up into the mouth at frequent intervals, and overflowing, the patient making little or no effort to eject it. This same character of the vomiting is a feature of the later stages, when blood is substituted for bilious fluid. In the absence of chloroform sickness, one finds that the first hæmatemesis is often quite sudden. The patient may or may not have felt faint for a short time beforehand, and, generally speaking, the degree of preliminary collapse is proportionate to the amount of the hæmatemesis, but it may happen that only a small portion of the blood contained in the stomach is vomited. In the majority of cases hæmatemesis sets in within forty-eight hours of the operation, though it may be delayed for some days. In two cases reported here, it did not occur until the seventh and tenth days.

The duration of hæmatemesis.—There may be only one or two occasions, within a period of two or three hours, on which blood is vomited, which is favourable; or the vomiting may continue at frequent intervals for a period of fifteen to twenty hours. This is the state of affairs in many cases, and has as a rule a fatal termination within twenty-four hours of the onset of hæmatemesis. A return of black vomiting may occur after an interval of some days, and in some instances the vomiting has continued off and on for several days.

The nature of the hæmatemesis.—The vomitus is generally small in quantity, to be measured in ounces; though in some cases, especially in those where the initial vomiting is a hæmatemesis, quantities of one to three pints of black fluid may be brought up. It consists, as a rule, of blackish brown fluid, with a varying amount of bile, and of digested blood, like coffee-grounds or the sediment of hare-soup. Occasionally clots of blood may be vomited, or even pure blood which has not clotted. This is associated with an ulcer perforating a vessel, or rupture of vessels, as in hepatic cirrhosis. In such cases the hæmatemesis is copious from the commencement. The total amount of blood lost in any case is not so great as one might easily be led to suppose, for it is mixed with more or less mucus, bile, and fluid present in the stomach; and an ounce or less of blood, when partially digested, will stain several ounces of stomach contents.

The general condition of the patient.—The feature of these cases that is most striking is the state of collapse and asthenia into which the patients often so rapidly enter. The condition is often a perfectly obvious toxæmia, from a recognisable septic infection of the operation wound. But in many cases, and chiefly in those of the greatest gravity, one is at a loss to account with certainty for the cause of the depression and rapidly advancing inanition. The temperature is rarely high, and often subnormal. The pulse is almost invariably rapid and irregular. Pallor, faintness, and coldness of the extremities are frequently prominent signs, and unduly so, if one considers the amount of blood that has been lost. In some, restlessness and mental acuteness, marked by an anxious and alert, though momentary, interest in trifling matters, is very prominent; such an appearance as, in the absence of tympanites or definite signs of peritonitis, makes one feel that one has to do with a general infection, whose course has been too rapid to permit of the appearance of those signs which enable one to make a diagnosis clinically of an infective process.

Etiology.—Many theories have been advanced to endeavour to explain the occurrence of post-operative hæmatemesis, but so far no particular one has served to elucidate all cases.

First, The administration of an anæsthetic has been suggested, but it is evident that if it had any relation to hæmatemesis the complication would arise more frequently, and would occur within a comparatively short time after anæsthesia; whereas, although in the majority of cases the hæmatemesis appears within forty-eight hours, in many cases several days elapse. Moreover, cases have been recorded in which hæmatemesis followed operations under cocaine.

Secondly, Laparotomy has been associated with the occurrence of hæmatemesis. It is difficult to conceive that the fact of opening the peritoneum has an immediate bearing on the condition, for it has followed operations on the palate (von Eiselsberg), on the bladder (Broca), in both of which no peritonitis or suppuration was found post-mortem; after lithotomy and litholapaxy cases two, and four in which the peritoneum was intact, and in three urinary cases referred to in a discussion by Guyon. Also, I have ascertained that it has followed amputation through the thigh, and the removal of a neuroma from an amputation stump. Still, it is not to be overlooked that, in the great majority of cases, the peritoneum has been opened either in some form of abdominal affection or in the course of hernia operation.

Thirdly, The vomiting after general anæsthesia cannot be regarded as more than a predisposing cause, as it is frequently absent and in many cases is slight. In some cases it may, no doubt, bring about ecchymosis of the gastric mucous membrane and the ultimate formation of minute digestive ulcers, or may cause an ulcer to perforate into a vessel.

Fourthly, Similarly, fasting before operation can only be looked upon as a possible predisposing factor.

Fifthly, Injury to the stomach or duodenum by surgical handling has been suggested as a possible cause of the formation of ulcers, and has been referred to by both von Eiselsberg and Schmidt. The appearance of such ulcers has been noted by Wagner, Körte, and Krönlein, but the injury has as a rule been more violent than can occur in ordinary circumstances. Injury may result in a definite tear of a part of the wall, or only a detachment of the mucous membrane from the deeper layers of the stomach. Whether the latter can be followed by an ulcer is a disputed point. Krönlein holds that the detached mucous membrane may be digested and result in peptic ulcer, while Rehn will not admit its possibility. Billroth has shown ulceration of mucous membrane over an embolus to occur more readily in the presence of acid gastric juice than in alkaline intestinal fluid. It seems probable, therefore, that ulceration can also occur after detachment of mucous membrane from the stomach wall. This explanation of hæmatemesis could, however, only apply to the few cases in which the stomach was invaginated to examine the pylorus, or otherwise handled, and moreover only in those particular cases in which some days have elapsed before the onset of hæmatemesis, for Krönlein has shown that a delay of several days exists between the receipt of injury and the appearance of severe symptoms. In Schmidt's case this explanation of the hæmorrhage is quite possible. More severe bruising of the stomach wall, as by the application of clamps, has been shown to result in ulcers. von Eiselsberg refers to three cases in which, after pylorectomy, ulcers appeared in the stomach unconnected with the line of suture which had healed.

Sixthly, "Thrombosis of the omental vessels after injury or ligature, followed by embolism in the wall of the stomach and formation of ulcers," is an explanation advanced by von Eiselsberg, and in six out of his eight cases omentum was ligatured and removed during the operation. In the seventh case the mesentery of the bowel concerned in an artificial anus was injured by the patient twisting and pushing back the protrusion himself. He bases his explanation on the investigations of von Recklinghausen, who has shown that it is possible for particles of tumour or pus to be brought from one part of the venous circulation to another directly, without passing through the lungs. This depends on the presence of a retrograde movement of the circulation in the veins, which can occur in tricuspid incompetence, and perhaps also in the course of violent coughing or vomiting. Other observers have recorded cases which prove that this may occur. This explanation can only hold good if, on examination of the liver and lungs, no deposits are found; otherwise the emboli must have followed the ordinary route. In reference to the stomach, in particular, von Eiselsberg considers that, after ligature of the omental branch of the epiploic artery, the vessel becomes thrombosed and the thrombus extends back to the origin of the vessel. The vessels lie at right angles to one another, and he conceives that a portion of the thrombus projecting into the epiploic may be swept off into the passing stream and carried on into some of the branches going to stomach wall, there to form a thrombus, and ultimately a digestive ulcer. He considers that this is the most prominent etiological factor in the production of post-operative hæmatemesis.

Friedreich has investigated the subject experimentally, and has found that ligature of vessels in the omentum results in most cases in points of necrosis in the liver. If the ligatured area approached the course of the epiploic artery, then he observed hæmorrhages or small ulcers in the stomach wall, their position corresponding to the distribution of the vessel; he showed specimens illustrating the changes in the stomach and liver, and stated that the vessels concerned in the ligature showed desquamation of epithelium. He considers that these changes were entirely the result of the omental ligature. He points out that the ligature of the vessels, apart from the mesh of the omentum, is sufficient to produce necrosis in the liver and stomach, and further indicates that vein and artery will invariably be ligatured together, and that the thrombus in the vein, which need not necessarily extend to the epiploic vein, is disintegrated by the inflow from the artery into the thrombosed mass. Thus is produced a simple hepatic embolism, and there is no need for retrograde movement in the veins. The artery under these same conditions may become thrombosed back to its origin, and in the manner indicated by von Eiselsberg produce embolism in the minute gastric branches of the epiploic artery. Friedreich suggests that embolism does not occur in all cases of ligature of omentum, because—(1) the blood in different cases will vary in quality; (2) the size of the omental thrombus will vary; and (3) the mechanical movement of the thrombus, as by vomiting, is more probable in some cases than in others. He also thinks that it is less common in women than in men, on account of the longer omentum of the former. His own three cases and three-fourths of von Eiselsberg's cases were men.

The theory of retrograde embolism is supported by experiments performed by Arnold and von Eiselsberg. The results obtained by Rodman and myself have been negative; no change, naked-eye or microscopic, being found in either the liver or the stomach.

Of the cases recorded here, this theory alone can be applied to four. In these the hæmorrhage began in from three to thirty-six hours after the operation. If one considers that several days elapse before the appearance of ulcers after injury (Krönlein), I think one is justified in concluding that three or six hours is too short a time to permit of the formation of an ulcer after embolism. It is probable that, if the thrombus were infected, the necrosis would be more rapid, but in two of the three cases in which von Eiselsberg considers the thrombus to have been infected, the hæmorrhage occurred later than in other presumably non-infected cases.

Seventhly, Sepsis is believed to be the cause by Rodman. That sepsis can produce congestion and small hæmorrhages in mucous membrane has been recognised. Billroth has observed duodenal ulcer after operation, which caused death from hæmorrhage, and which he believed was referable to the septicæmia present. Dieulafoy records six cases of hæmatemesis during appendicitis, four of which proved fatal. He found in the gastric mucous membrane minute ulcers, which he attributed to the toxæmia producing hæmorrhagic necrosis of the mucous membrane. Similar cases have been recorded by other observers. Lucas Championnière has remarked on the occurrence of hæmatemesis in the course of sepsis, especially when associated with abdominal malignant disease. Guyon has observed hæmatemesis in three cases where a septic infection of the urinary tract existed. Sepsis is held responsible for the duodenal ulcer following burns (Billroth). Although von Eiselsberg considers embolism to be the most prominent factor, he states that probably the emboli in different cases vary in virulence, and considers that in five of his cases some degree of infection of the embolus existed; in one a "slightly virulent embolus," and in four "infected thrombi." But, on the other hand, there are cases recorded where it appears certain that no septic infection was present. In this series of eleven cases, in only one was there no indication of sepsis. In all the others a source of infection was certain or probable. Mayo Robson considers that none of the suggested causes referred to can satisfactorily explain the occurrence of hæmatemesis, and thinks that it depends on—

Eighth, A nervous reflex influence. This is no more easy to prove than the other suggestions, but if it were a true solution of the question, it is, I think, admissible to suppose that sepsis would, in many cases, determine the onset of the reflex, or prolong the duration of its action, and thus render the condition more serious. In favour of this theory, and against sepsis, Robson points out that in many of the cases tympanites and other signs of septicæmia are absent.

In relation to the causation of gastric ulcers, there is, in the *British Medical Journal* of January 18, a note of interesting experiments by Dr. Van Ijzeren, a Dutch physician, who has, by division of the pneumogastric nerve below the diaphragm, in rabbits, produced, in eleven out of twelve cases, gastric ulcers corresponding to those found in man, the ulcers forming two to three weeks after division of the nerves. He attributes the production of the ulcers to necrosis of mucous membrane, following on obliteration of vessels by muscular spasm. Reflex nerve influence to produce hæmatemesis will, in all probability, act on vessels; and, considering the fact that Van Ijzeren found ulcers took two weeks to form after nerve section, it is difficult to see how the relatively slight stimulus to reflex action produced by operations, which in many cases have not concerned the abdomen at all, could in a few hours bring about a change in normal mucous membrane sufficient to result in hæmorrhage.

Ninth, The pressure of gauze packing on the bile ducts and portal vein is referred to by Kehr as a possible cause, but he has seen hæmatemesis in cases where no packing was introduced. He has seen it in several cases after operations on the liver and gall bladder, and also after a Bassini's operation for hernia, and remarks on the absence of peritonitis in such cases.

Finally, It is, I think, clear that all cases of post-operative hæmatemesis are not due to any one cause. In a certain number of cases it can be attributed, without doubt, to gastric ulcer or rupture of a vessel, where atheroma or cirrhosis of the liver is present, and in such cases it is no doubt precipitated by chloroform sickness. Injury, and a non-infected embolus from ligatured omentum, may similarly account for some cases. But, I believe, in those cases in which such an explanation is not possible, and they are the majority, that the origin is of an infective nature. In many cases the association with sepsis is clear, but in others, where the absence of conclusive signs of septic infection exist, where there is no sign of gastric ulcer, cirrhosis, or atheroma, where no ligature of omentum has been performed—in these cases I regard the condition as one in which a transient infection has occurred, the only obvious evidence of which is the hæmatemesis. In some cases, at first inexplicable, the appearance of a suppurative parotitis, or a small abscess after several days, indicate the relation of the hæmatemesis to an infective process. Ordinary cases of gastric ulcer can lose a very large quantity of blood, without death ensuing, and the relatively small amount lost in post-operative hæmatemesis could not possibly, unaided, bring about a fatal result. A superadded toxæmia alone can account for it.

This view is confirmed by Engelhardt and Neck, who, after a long series of experiments on the relation of ligature of the omentum and its relation to hæmatemesis, come to the conclusion that one must, in case of ulcers or erosions in the stomach, first exclude bacterial infection of the stomach, by careful microscopic examination, before considering hypothetically other possibilities.

Referring to the method of infection of the stomach, after omental ligature, they conclude that it occurs either directly from the omentum, by passing back along the thrombosed veins, or through the systemic circulation.

Prognosis.—Is always grave. The conclusions I have come to are these—

1. The more marked the septic reaction is in a case—as shown by discharge from the wound and temperature—the better is the chance of recovery.

2. Subdued or masked infection, with subnormal temperature and rapid pulse, a rapidly increasing vital depression, the vomiting tending to become regurgitant—all these render prognosis graver.

3. If bilious vomiting appears *after* one or two hæmatemeses, the prognosis is favourable. The only three cases in which this sign appeared, recovered.

Treatment.—The line of treatment to be adopted is one similar to that used in cases of septicæmia. The stomach should be washed out at once with 2 per cent. soda solution, at a temperature of 110° to 120° F., until the fluid returns clear; to be followed by a washing out with a 1 to 1000 solution of nitrate of silver. Where collapse is marked, infusion of normal saline into a vein should be done as well, and both procedures should be repeated if there is any return of hæmatemesis or collapse. Strychnine hypodermically is of value. All cases should be fed per rectum, and no nourishment should be given by the mouth. Tripier recommends high hot-water enemata, the free use of calomel and ice to the epigastrium. Dehler employed ice-cold saline solution for lavage of the stomach, followed by 1 in 1000 nitrate of silver solution, as advocated by Kehr, which, in conjunction with saline infusion into the veins, brought about the recovery of his case. In a case at present under treatment in Prof. Annandale's wards, lavage with hot saline, followed by the introduction of 15 minims of a 10 per cent. cocaine solution, has yielded excellent results.

Suprarenal extract or adrenalin has not been tried in these cases, so far as I know; the disadvantage of this agent appears to lie in the transient nature of its action, and the tendency for a reaction when its hæmostatic effect has passed off.

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NOTES ON SOME SURGICAL ASPECTS OF OSTEO-ARTHRITIC JOINT DISEASE.

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FEW, if any, of the diseases of the joints present themselves under so many varying guises as osteo-arthritis. Not improbably this may be because the disease, as now classified, is really due to a number of different essential causes. However that may be, it is not intended to discuss the matter here. But, in whatever form the disease may come under notice, it is usually of such a nature that any surgical interference is quite uncalled for, and only general medical treatment, baths, and local applications of various sorts are suited to its relief, cure being, in the nature of the case, not to be expected, in view of the changes in the bones and cartilages.

There are, however, a few conditions of these joints, and the parts in their vicinity, in which active surgical interference is of benefit, and it is to this class of case that these notes refer.

It is especially when the disease is of the monarticular form that conditions may arise such as are here referred to, and only very occasionally in them.

Osteo-arthritis has been termed arthritis sicca, due to the fact that, as a rule, the disease is accompanied by little or no effusion; but occasionally this condition of matters is reversed, and the presence of an effusion is the first, and even for a long time the only, sign of the disease; and should this effusion prove obstinate to treatment, the case may appear one of chronic hydrarthrosis, and may be amenable to treatment suitable to that condition.

The following case is an example of such a joint:—

CASE 1.—G. C., a married woman, came under my care in August 1901. She was suffering from a chronic effusion into the left knee-joint, which she had had for some length of time, and for which she knew no cause. On examination, the joint capsule was found to be lax and full of fluid, no very definite thickening of the synovial membrane could be made out, nor any lipping of the bones, nor any definite creaking in the articulation on movement. The range of motion was also fairly free, but full flexion and full extension could not be obtained; though the limitation in the latter direction was very slight. There was a scar of an old incision on the inner side of the joint. Her other joints were normal. On inquiry, it was found that she had suffered from a similar trouble three or four years before, for which an operation had been done. This led to an investigation as to what had then been done, and for what reason. Her old notes were looked up, and showed that her condition then had been in every respect similar to her condition now, and that after a lengthy attempt to get rid of the fluid in the joint by rest, counter-irritation, strapping, pressure, and the like, as no improvement resulted, an incision was made, partly with a view to treatment, and partly with a view of finding out to what cause the effusion, which had come on without any apparent cause, was due, as it was thought that most probably it was dependent on tubercle. At the operation, however, no sign of tubercle was found, and a small piece of the slightly thickened synovial membrane was removed for investigation. No other abnormality was to be noticed in the joint. It was therefore drained for a few days, and the wound allowed to close. The examination of the material removed proved negative, but the result on the joint was satisfactory, as the effusion had not recurred until she came under my care. As all ordinary treatment for chronic, simple effusion did not prove satisfactory, and in view of the good result of incision when previously under treatment, this was again done; but on opening the joint a very different condition of parts was found, the edges of the tibia and femur being distinctly, though not very greatly, lipped, while at the same time the cartilages showed the characteristic signs of osteo-arthritis. Drainage was instituted, as before, for a few days, and then the wound allowed to close, the joint being kept at rest only just long enough for this to occur, and then passive movement and friction, with later active movement, instituted. The fluid did not recur while the patient was under observation, and the utility of the limb was largely restored, though, no doubt, as the disease is a progressive one in most cases, the improvement may very probably only be temporary.

An interesting fact has been noted with regard to the nature of the fluid contained in the joint in some of these cases, namely, that it differs in character from that found in ordinary cases of synovitis, in that it is much more serous and less oily. This was certainly the fact in the joint above referred to, and may, perhaps, sometimes be an additional cause to the changes in synovial membrane, cartilages, and bones, for the creaking and stiffness which is so usual in the disease.

The result in the above case was so satisfactory, that it would lead one to think that in cases which are known to be osteo-arthritic, it may sometimes be advisable to drain the joint for a time if an effusion should occur which proves obstinate to other treatment, and in which it is the effusion which appears to be the main barrier to the utility of the articulation. It is most important, in a case of this sort, that the joint be not kept long at rest after the operation, as, if this be not attended to, the result is not unlikely to be the development, while it is at rest, of the lipping of the bones or cartilages in such a position that, when movement is commenced, the range of motion is found to be much more limited than it was before the operation. This, of course, also applies, as is well known, to these joints when rested, whether operated on or not.

Effusions into bursæ are very common in the disease under consideration, and this effusion may not only be into bursæ which are in direct connection with a diseased joint—as, for example, the semi-membranosus bursa—but also into bursæ which are in close proximity to a diseased joint, or possibly in some cases even at some distance away. Many years ago these bursal swellings were described by Morrant Baker. They may occur in connection with any of the joints, but are more frequent in connection with the knee-joint than with others. The cyst formed may be merely an enlargement of an ordinary sac that has previously existed, or it may be due to a bulging of one of the small pouches of the joint synovial membrane. Why these latter should become distended it is a little difficult to understand, as it seems certain that in many of the joints with which they are found connected, though there has no doubt been a certain amount of fluid present antecedent to the filling of the bursa, there has certainly never been any distension such as might be thought capable of causing the synovial membrane to bulge. The diagnosis of these cases is usually easy, if the possibility of their existence be kept in mind; the mistakes that are made being generally due to the fact that the swelling being a bursal one has never occurred to the examiner. Occasionally the recognition of the condition may be very difficult, as when the track connecting the joint with the cyst happens to be a very long one, or has become more or less closed, so that the connection between the two is only with difficulty established. In such cases, however, the existence of some chronic mischief in the joint, in the vicinity of a chronic cystic swelling, which shows no signs of inflammation, will lead one to suspect, if not to actually diagnose, the condition before operation.

It must always be remembered that in examining these cysts, in order to demonstrate their connection with a joint, it may be necessary to put the articulation into various positions of flexion or extension before the opening is patent, and therefore allow some of the fluid to be pressed out of the swelling into the joint cavity. This, of course, is well known in enlargement of the semi-membranosus bursa, which empties its fluid into the knee when this is flexed. But this is not the only case in which a similar condition may obtain.

The same treatment is not suited to all these cysts, a good deal depending on the exact seat of the swelling, its connections, and the condition as to age, and as to other joints being affected in the patient in whom the swelling is found; also the amount of inconvenience to which it gives rise, for unless it is really giving considerable trouble, it is as well, as a rule, to leave it alone.

One or two examples will best indicate the various lines of procedure that may be adopted.

Case 2.—Early in 1901 I saw in the out-patient room a woman of about 50 who complained of a swelling behind her left knee. On examination, this proved to be an enlargement of the semi-membranosus bursa. A further examination of her knee-joint showed that it was affected with a certain amount of osteo-arthritis, though it had never given her any trouble; distinct lipping of the femur could, however, be easily made out, but there was very little fluid in the joint. In view of her age, and the small amount of inconvenience that the swelling gave her, it was clearly not a case in which it was advisable to recommend any operative treatment, so she was put on syrup of the iodide of iron, 1 drm. three times a day, advised to paint the knee with linimentum iodi every night until the skin got sore, and then to omit a night or two until the soreness passed off, after which to recommence the painting. This treatment she continued for some weeks, during which time the swelling got gradually smaller. I then lost sight of her for about a year, when she returned complaining of some pain in the joint, of the usual type in these cases. The signs in the articulation remained much as before, but no sign of the enlargement of the bursa could now be found. In this case the effusion into the bursa had become absorbed in the same way that it usually does in the passing effusions into the joints that are so frequently present in the course of the disease.

Another method of treatment is excision of the cyst. The following case is a good example of this:—

Case 3.—The patient was a male of about 45, who complained of a large swelling in the calf of his left leg, which, however, gave him no pain. The swelling was fully the size of a moderately large cocoa-nut, and obviously contained fluid. It had come gradually in the course of some months, and he knew of no cause for its appearance. On careful examination of the left knee-joint, it was found that it was the seat of marked osteo-arthritic change, of which he was quite unaware, as neither it nor any other of his joints had ever given him any trouble. The cyst was excised, but at the operation no connection could be found between it and the knee-joint; subsequently the swelling recurred, and a fresh operation was undertaken for its removal. It again seemed as if no opening would be found into the joint, but this was ultimately demonstrated, when the knee was fully flexed, as being under the inner head of the gastrocnemius and the tendon of the semi-membranosus; the reason for the difficulty in finding it being due to the fact that, in extension, the tendon of the latter muscle lay so tightly applied over the opening that it could not be seen; the entrance into the joint was ligatured, and the wound closed. The man was subsequently seen several times, but so long as he was kept under observation the cyst did not recur. The subsequent utility of the knee was good.

In cases where the enlarged bursa is situated so that it can scarcely be excised with safety, it may sometimes be incised and drained with advantage, as the following case shows:—

Case 4.—A man between 40 and 50 complained of a swelling in the left groin which incommoded him in walking, and gave him some pain. On examination, a swelling was found, about the size of an orange, clearly containing fluid. It lay immediately under the common femoral artery, which it pushed forward. There were no signs of inflammation about it, but there were some signs of osteo-arthritis in the hip-joint under it, as shown by some limitation of motion and some creaking on movement. There were also some signs of this disease in some of his other articulations. As the swelling seemed to be giving him a good deal of trouble, an incision was made to the inner side of the tensor vaginæ femoris muscle, and the swelling opened. It was found, as suspected, to be an effusion into the psoas bursa. Careful examination failed to show any connection with the joint. The cyst was thoroughly scraped, and then rubbed inside with pure carbolic acid, and a drainage tube put in, the rest of the incision being sewn up. The tube was taken out in a day or two, and the wound allowed to heal. This it took some little time to do, as there continued to be some leaking along the track of the tube, but in a few weeks the wound was quite sound. The fluid, as far as is known, did not reaccumulate.

A similar treatment to this is suited to the enlargement of the bursa under the deltoid muscle.

Bursæ may also occur as the result of the pressure which a deformity caused by osteo-arthritis may entail on some prominent point of bone.

A very good example is frequently seen in the common bunion over the head of the first metatarsal bone in the foot, in cases of hallux valgus, for, although no doubt this deformity is frequently due to other causes than disease of the joint, still it is also very often the result of such disease in persons, particularly those who are beyond middle life, and especially in women; a bursa then forms over the prominent head, which, owing to its position, is very likely to get rubbed and inflamed, and may suppurate, and may even go on to infection of the joint, and hence cause a good deal of trouble, pain, and damage to the foot.

In such a case as this the treatment of the bursa should include the treatment of its cause, that is to say, the excision of the cyst should be accompanied by the well-known procedure for the cure of the deformity, namely, excision of the head of the metatarsal bone, which should be done through an incision extending in a horse-shoe manner on to the dorsum of the foot, so as to avoid leaving a scar in a position subject to pressure. In most cases where this is done on a person past middle life, it will be found that the bone shows obvious signs of lipping of the edges of the articular surface, with some attrition of the articular cartilage in places. The result of the procedure is the formation of a fibrous joint, with the toe in good position, and there is little or no tendency for the deformity to recur. A similar treatment, by excision of the diseased joint, has been suggested for the large articulations when one of them alone is severely affected with osteo-arthritis. I have had no experience of this method myself, and there can be very few cases, I think, in which it is to be taken into consideration, and even in these few I should very much doubt its advisability, as it seems doubtful if it would necessarily relieve the trouble, as the disease might quite possibly continue in the parts left, in the same way that it has been known to start in the ends of a fractured bone where no union has occurred. Also, the general constitutional depression of a big operation, such as excision of the knee, is likely to have a deleterious effect on the patient, with regard to his other joints, in a disease in which depression of the general health certainly plays a part in its causation.

Loose bodies are not very infrequent in the subjects of this disease, and sometimes the presence of one of these is the first thing which calls the patient's attention to the condition of his joint.

Case 5.—This was the case in a doctor whom I saw in 1901. He was a man about 45, who led a very active life, having a good-sized practice in a somewhat poor neighbourhood, so that he did a great deal of walking. A month or two before I saw him, he had noticed some weakness of his right knee, which occasionally became fixed for a moment, and then was free again; more especially, also, when going up and down stairs he found it to be very stiff. On examining it he at once noticed a movable body in its cavity on its outer side, which became more or less fixed at times. When I saw him, this movable body was very easily found, and slipped about freely. There were also very marked signs of osteo-arthritis in the joint; also in the opposite knee the condition was almost more marked, though he was quite unaware of any trouble in that articulation. I recommended him to have the loose body removed, as this was clearly what was at present hampering his joint, and not so much the primary disease. He was, however, unable to lay up for the short time which would have been required for the operation.

The importance of removal of a loose body is especially great in a case such as this, for the repeated injuries which the joint receives by the nipping of the loose body between the articular surfaces is very likely to accelerate not a little the advance of the primary disease to which the loose body was originally due.

The question of injury to joints affected with osteo-arthritis is one of some importance. In many cases nothing further results than some effusion, which sooner or later clears up, leaving the joint with a good deal of stiffness, but otherwise much as before. This is, however, by no means always the case, even if the injury to the joint has not been a severe one.

This is particularly so in the hip. For example, a man falls and gives the hip-joint a wrench, which in a healthy individual would only give rise to a certain amount of pain, stiffness, and loss of free mobility, and which, on examination of the joint, would give no signs of any lesion of moment, a few days rest restoring its functions completely. In some cases, however, in a joint the subject of osteo-arthritis, injured in this way, it will be found that, instead of the articulation improving as time goes on, it gets worse, and, on investigation at the end of a few weeks, it will be noted that there are now marked signs of destructive disease, shown by a little shortening, a good deal of wasting of the muscles of the thigh, and some eversion of the whole limb, which now lies much in the position of a case of fracture of the surgical neck of the femur, which might lead to the opinion that this accident had been overlooked, if the original examination of the injury has not been carefully carried out. The true explanation of the condition now present is to be found in the existence of more or less latent disease in the joint antecedent to the accident, which has been stirred up to greatly increased activity by the traumatism. The knowledge of this possibility should lead one to give a very guarded prognosis in cases of injury to a joint, even if not severe, if there should be any reason to suspect latent disease of the injured joint, from the presence of disease in the other joints, or for any other reason. Similarly, in the shoulder it is often found that a comparatively trivial accident will sometimes lead to grave interference with the function of the joint in a person past middle life, and the wasting of the muscles, particularly of the deltoid, is often especially marked in these cases. The treatment of this condition requires to be conducted with a considerable amount of care, to obtain the best results; at first, of course, rest *must* be given to the joint, but, as far as possible, it should be kept at rest in a position with the upper arm not too closely applied to the side of the chest, but markedly abducted by a pad of considerable size in the axilla. Rest, however, should not be continued for any great length of time, but only until the effusion into the joint has to a large extent gone; the joint should then be moved passively, if this can be done without violence, the range being gradually increased, but only the smallest amount of force possible should be used for this purpose. Sometimes this is not feasible, owing to the pain which it causes. If it can be done, however, it will very materially increase the utility of the joint, when active movement of the articulation is again possible to the patient, by preventing the formation of lips on the bone in such a position as to limit the range of motion. Friction over the joint, persistently carried out, and preceded in each case by bathing with hot water, and followed by carefully swathing the joint in warm flannels to protect it from the cold, will, I think, in most cases give the best results. This treatment should be combined with careful attention to the general health, so as to improve the general nutrition, which has in most cases a very distinct influence on the improvement of the joint; while, in obstinate cases, a course of treatment by douches, etc., at one of the watering-places, such as Buxton, Bath, or Strathpeffer, or the hot-air bath locally to the affected part, may be found very beneficial. In the hip, less, I think, can be done than in the shoulder, the most important point being to prevent a crippling deformity, such as great adduction of the thigh, or very marked eversion. The former malposition is easier to prevent than the latter, as in the latter it is due to the destruction of the head of the femur to a greater or less extent, while in the former it is more because the joint has been allowed to get into a bad position, and to remain so, that the deformity is due. In order to obviate the long-continued rest in bed, which might otherwise be necessary, to the probable detriment to the utility of the other joints, a well-fitting Thomson's splint will be found the best appliance, though it is very noticeable that adult patients do not take nearly as kindly to this apparatus as do children.

THE PROPOSED PSYCHIATRIC CLINIQUE FOR EDINBURGH.

By JOHN MACPHERSON, M.D., *Commissioner in Lunacy for Scotland.*

IT may surprise many to learn that before the building of the chartered asylums and the passing of the Lunacy Laws, the insane were treated in many general hospitals in this country, and that the old Edinburgh Infirmary contained a department set aside for the treatment and observation of mental diseases. The methods of treatment were perhaps neither advanced nor too humane, but in passing judgment upon them one must not lose relative touch with the state of knowledge or the social and ethical standards then prevailing. When the insane of the country had been more or less completely removed into asylums, and when for its better protection this unfortunate class was placed under State supervision, it was considered that an important social advance had been achieved. Any one who has read the Report of the Royal Commission of 1857, upon the state of the insane in Scotland at that time, will readily concur in this belief. But, with all the inestimable benefits of the new Acts before them, it soon became manifest to several of the keenest medical minds of the time, both within and without the speciality, that while there had been a gain there had also been a loss. It was seen that mental diseases were, on the scientific side, losing touch with the advance which was taking place in the investigation of other diseases, and that, while the administrative side was developing enormously, the medical side remained stationary. In Germany the same idea so greatly impressed Professor Griesinger, that he was impelled to the effort which succeeded in establishing in the Charité at Berlin the first psychiatric clinique in Germany. Since then, upwards of thirty-five years ago, the movement has spread until there is no university in Germany without a professor of psychiatry and a clinique of some kind. An analogous train of thought in regard to this subject has all along existed in this country. So far back as 1823, Dr. John Reid, a London physician, observed[1]: "It is not in the adult and fully established form of insanity that we can best learn its origin or become thoroughly acquainted with its character. A mad-house is, on this account, an insufficient school for acquiring an intimate and correct knowledge of madness. No man by studying merely a hortus siccus would think of making himself a botanist. In order to lay any claim to that title, he must contemplate plants, not as they are pinned down in a portfolio, but at the period when they first emerge from the soil and at every successive stage of their history and growth." In 1865, Dr. Maudsley carried a resolution unanimously through the Convocation of the University of London, declaring the necessity of including clinical instruction in mental diseases in the medical curriculum; but the university refused to make the subject compulsory, until they had evidence that there existed suitable provision for its teaching. Two or three of the London schools immediately thereafter appointed lecturers. In a letter written shortly afterwards to Sir Arthur Mitchell, Dr. Maudsley expressed the opinion that, until a reception house, with 150 beds, for all forms of acute mental cases, was erected in a part of London accessible to medical students, the clinical teaching of mental diseases could not be considered satisfactory. In 1871, at the time when the present Royal Infirmary was being built, Sir Arthur Mitchell, who was then Morison Lecturer, opportunely devoted one of his lectures to the manifest advantages of teaching insanity clinically within the same building in which other diseases were taught. He dealt specially with the unhappy divorce which exists between the study of mental and that of other bodily affections, and urged the desirability of providing psychiatric wards in the new hospital. He and his colleague, the late Sir James Coxe, were so far successful in promoting this idea, that plans were actually prepared embodying the scheme in the building of the Infirmary, but these were sacrificed to make room for what were regarded as more important requirements.

Some years prior to this, Sir John Sibbald visited Germany, and became impressed by the working of the clinique established in Berlin, through the energy of his friend, Professor Griesinger. In 1868 he published a translation of an article by Professor Griesinger on this subject, and in 1870 he read before a meeting of the Medico-Psychological Association in Glasgow a paper strongly advocating similar institutions in this country. After this the question appears to have rested until the appearance of an article in the *Nineteenth Century* for April 1889, by Sir John Batty Tuke, which created a widespread revival of interest. This was followed by the appearance, in January 1890, of a Report by a Committee of the London County Council, presided over by Mr. Brudenell Carter, which recommended the council to erect in London a hospital for the scientific study and investigation of mental diseases. Again, in the *British Medical Journal* for 1891, Sir John Tuke, who has always been a strenuous advocate of the scheme, reiterated his views in an article entitled "A Plea for the Scientific Study of Insanity." Finally, in the *Scotsman* of last July 4, appeared an unsigned article on the "Teaching of Psychiatry," which has had the effect of reopening the subject in a form which it is fervently hoped may ultimately be successful. In that article was pointed out the conspicuous failure of the medical schools of this country to keep abreast, in this particular, of those of Germany, Austria, France, and, it might have been added, Russia. The wider questions of the advancement of science and of the improved treatment of patients labouring under nervous and mental affections were also dealt with. The working details of the scheme were not, however, referred to; but, as the subject has since matured itself, a brief consideration of them may not now be inopportune.

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[1] "Essays on Hypochondriasis and other Nervous Affections."

In a large hospital like the Edinburgh Royal Infirmary, it happens that a congeries of mental cases is constantly present. Toxic deliriums occur from time to time among the ordinary cases while undergoing treatment; alcoholics admitted with injuries develop occasionally acute alcoholism; suicidal cases with or without injuries are from time to time sent in by the police. These and similar instances, too many to enumerate, form a body of undoubted insanity which is located in a special ward.

Such being the case, it is worth reconsidering the attitude which this hospital, forming the clinical nucleus of a great medical school, should assume towards this question. It is true that the insane are otherwise provided for by Statute, and that for a time—so long as to be practically indifferent to the present purpose—certified lunatics will continue to be strictly looked after by the State. But in a civilised society social requirements tend slowly to replace statute law in less important details. When the Lunacy Laws were passed forty years ago, the attitude of society towards the insane demanded the strictest regulations, but the tendency of legislation since then has undoubtedly been towards a wider discretion in dealing with the insane. Scientific research is every day showing more and more clearly that insanity is a physical disease, *e.g.*, general paralysis, which ten years ago was believed largely to be a premature decay of the brain, is now known to be a toxic disease, and in the great proportion of cases to be a consequence of previous syphilitic infection. Similar researches are tending to prove the toxic basis of other mental diseases, which not long ago were regarded as unaccountable entities.

Insanity, then, is a physical disease pure and simple, and many forms of it are eminently susceptible of yielding to suitable treatment in the early stages. It is socially a terrible disease. The victim and his relatives may for long be haunted by a dread of its incidence, but unless they are rich or well-to-do they are excluded from the benefit of special knowledge, other than that which their ordinary medical attendant happens to possess. Even if the family doctor is of opinion that a working man or an artisan's wife is becoming insane, what can he do? The law practically says: "If the man is insane, let him be sent to an asylum; if he is not certifiable, let him remain at home until he is, and then he will be attended to." The position here suggested is unfortunately not fanciful. Its painfulness may easily be imagined. Somebody may say, why not consult a specialist? If the Royal Infirmary were done away with, where could the Edinburgh poor, suffering from recondite maladies, find specialists? No doubt, any asylum superintendent would gladly give advice gratis to deserving cases; but there is a very natural prejudice against going to asylums for medical advice. Advice is undoubtedly serviceable, but it often is analogous to giving a stone to a person asking for bread. The "doubtful" case who cannot be certified; the case who is intelligently lucid, but thinks strange thoughts, or fears unreasonably, or is sleepless or is distressed by obsessions or a tendency to unsocial impulses; the hypochondriac and hysteric on the borderland between sanity and insanity; the person developing various forms of mental affections or suffering from minor forms—all these and others require observation, examination of a minute and delicate kind into their nervous phenomena, and into the chemical and microscopic changes that are proceeding in their bodies. This can only be done in a properly equipped department, with a physician at its head who is a specialist, and a man possessed of scientific attainments.

If there is any truth in the foregoing statements, and most medical men would endorse them heartily, it is clearly evident that there is room in a city like Edinburgh for the exercise of a great charitable undertaking. This gap in medical charity can only be filled up by such a body as the Royal Infirmary Managers. Not only would they be doing a directly charitable work in this respect, but they would also be instrumental in saving some of these cases from the stigma of technical pauperism, and the more clinging stigma of insanity; for it is almost beyond doubt that some cases, however few, would be spared the ordeal of having to go to an asylum.

The scientific aspect of a scheme for providing wards in the Royal Infirmary for the treatment of mental affections, is also important. It is well known that scientific medical research flourishes best in the atmosphere of a great medical school. No doubt much useful work is being done in various asylums throughout the country, but such work is apt to be sporadic, and is too dependent upon individuals who are changing frequently, and whose efforts are apt to be absorbed in the multifarious administrative duties of managing large public institutions. There does not exist in this country, at the present time, a psychiatric physician whose scientific work is detached from the onerous task of administration, and it is therefore impossible to expect such men to engage in the same manner of purely scientific research, which has made many of the continental psychiatric physicians so famous. If the Professor of Medicine in the University of Edinburgh were Superintendent of the Royal Infirmary, would it be reasonable to expect him to detach himself into two personalities of consequence, the one scientific and the other administrative? There is an enormous amount of work to be done in psychiatric medicine, and we are only as yet on the threshold of it. With such a laboratory as that of the Scottish asylums (for the conception and establishment of which we are largely indebted to the efforts of Dr. Clouston) situated at Edinburgh, it would be greatly to the interest of science if a corresponding clinical department were established side by side with it, and if these two departments could be got to work hand in hand. The advance in Scotland in this subject would then be incalculable.

In urging that the facilities for medical instruction should be rendered as complete as possible, by the addition to the hospital of wards for the treatment and observation of mental maladies, it is not forgotten that in Great Britain, at the present time, no such wards exist in connection with a general hospital. It is, however, certain that, in the course of time, such an advance will be made by one or other of the great medical schools. The promoters of this scheme point out that in the Infirmary such a ward exists as a necessity, but without recognition and without any use being made of the clinical material it contains. They express the opinion that if this ward were made the nucleus of a new department, with an out-door consulting-room, both under a special physician, the object they seek would be accomplished, and future development, the result of experience, would complete the work. Undoubtedly a Professor of Psychiatry in the University, at the head of such wards, would form a unified ideal department in the scheme of medical education, of paramount importance to science, and to the reputation of the Edinburgh School. Such a Professor would, of course, rank with other clinical professors on the staff of the Infirmary. He would be in the wards daily, and would lecture both clinically and systematically. By arrangement he might have access to the wards of one of the asylums in the neighbourhood, and participate in the advantages of the Scottish Asylums' Pathological Laboratory. The mutual benefit to both departments would be obviously very great.

Such, briefly, is the plea for this scheme. All that is needed for its realisation is, that the Infirmary managers should provide wards sufficiently large to permit of from 150 to 200 patients passing through them annually. By doing so they would extend their charity to a deserving class of sufferers, they would promote scientific knowledge and the best interests of the great school with which they are so closely allied, and they would place, within easy access of the medical student, facilities for clinically observing a highly important disease, at the stage at which its observation will be most useful to him and to others in the future. Not many years ago such a request would have involved the somewhat serious proposition of erecting a small asylum with various expensive and cumbersome adjuncts; but recent advances in the treatment of insanity have shown that even acute cases of mental disorder can be better nursed and more successfully treated in beds and in wards, differing slightly, if at all, from those generally used for patients suffering from physical diseases.

NOTES OF A CASE OF CHLOROMA AND OF THREE CASES OF LYMPHATIC LEUKÆMIA.

By Byrom Bramwell, M.D., F.R.C.P.Ed., *Physician, Edinburgh Royal Infirmary.*

Case 1.—*Chloroma.*—Married man, æt. 25, a teacher of music; enjoyed excellent health till October 1900, when he accidentally discovered a small glandular swelling on the left side of the neck below the jaw; a week later a similar swelling developed on the right side of the neck. In January 1901 an eruption developed on the front of the chest, and gradually extended over the greater part of the body. In February, rheumatic pains were felt for a fortnight in the back. In April the face and gums swelled, the eyes became watery and painful, the voice husky, and some deafness developed. On May 22, 1901, the patient was sent to me by Dr. Douglas of Cupar. The condition was then as follows:—The patient was much debilitated, and had lost a stone in weight. He complained of soreness of the mouth and gums, and of deafness, more marked in the right than in the left ear. He was not anæmic. There was no excess of white corpuscles in the blood. The face was swollen, the swelling being chiefly due to the presence of nodular swellings in the skin, œdema of the skin, and glandular swellings in the neck and parotid regions. The voice was husky; the breathing attended with some stridor; there was frequent cough; the patient could not breathe through the nose. The pulse was quick (120 to 130); the temperature 100°·6. A remarkable eruption was present over the greater part of the body; it was copious on the thorax, abdomen, back, arms, face, and scalp; sparse over the lower extremities. The eruption consisted of flat-topped nodules, varying in size from a pin-head to a sixpence; in many places the nodules were confluent, and produced a uniform raised infiltration of the skin; the nodules were painless, not adherent to the deeper parts, and, for the most part, of a slaty grey or purple-grey colour; some of them were yellow in their centres. The gums were enormously swollen, firm, and of a dark purple colour; the right tonsil was much swollen, and of a dark purple colour. The conjunctivæ presented a peculiar appearance, being infiltrated with a translucent fleshy-looking growth, in which vessels could be seen ramifying. There was no exophthalmos. The optic discs were normal. The glands on each side of the neck below the jaw were swollen, hard, and painless. The parotid glands appeared to be enlarged. There was some symmetrical swelling in each temporal region. The splenic dulness was increased. The liver was somewhat enlarged. The urine was normal. There were no pigmented moles or warts; and I concluded that the case was probably one of melanotic sarcoma, with peculiar infiltration of the skin, gums, tonsil, and conjunctivæ. The patient was admitted to the Edinburgh Royal Infirmary on May 23, and remained there until his death, which took place a month later, on June 24. Microscopical examination of portions of skin excised during life showed that the case was not one of melanotic sarcoma; the nodules in the skin consisted of lymphoid deposits, and were entirely made up of small uninucleated round cells. The blood count showed that the red corpuscles numbered 4,480,000, and the white corpuscles 8000, per c.mm. The white corpuscles were almost entirely (95 per cent. or more) lymphocytes, chiefly large lymphocytes, with large nuclei and clear non-granular protoplasm. During the month that the patient remained in hospital, the blood condition remained practically the same; the temperature was elevated (highest 104°), and the pulse remarkably quick (from 110 to 160), the respirations always above the normal (25 to 35). The breath was foul; the gums occasionally bled slightly. No micro-organisms were detected (either in stained films or after incubation of gelatin tubes) in the blood. The skin eruption increased, and many of the nodules became yellow, some yellowish green, and a few on the face distinctly green in colour. The face became much more swollen. The fleshy infiltrations of the conjunctivæ became much larger. On *post-mortem examination*, the skin lesions (nodules) on the face, thorax, abdomen, back, and arms were of a green colour; some of the glands in the neck were green, the tonsil was green, the epiglottis and laryngeal mucous membrane were green. The bones of the head and face were not examined (permission was limited to the respiratory and abdominal cavities). The glands in the neck were enlarged, the spleen and liver were enlarged; the gums, tonsils, epiglottis, and larynx were greatly swollen, the swelling being due to lymphoid infiltration. The bone marrow of the ribs contained some, but not very numerous, lymphoid cells, similar to those in the skin, gums, and blood. There were some petechiæ on the heart. The thoracic, abdominal, axillary, and inguinal glands were hardly at all affected. The kidneys were infiltrated in places with lymphoid deposits.

The case was undoubtedly one of chloroma. The condition of the blood corresponded to that of acute lymphatic leukæmia, and it is very important to note that the leucocytes (95 per cent. or more of which were lymphocytes) were not increased in number (8000 per c.mm.). The mere fact that the leucocytes are not increased in number does not exclude leukæmia. It is necessary to note the character of the leucocytes in stained films. The case was remarkable because of the skin lesions and the very peculiar infiltration of the conjunctivæ, gums, epiglottis, and larynx. I have never seen anything like the condition of the gums, conjunctivæ, epiglottis, and larynx before. Curiously enough, another case, in which exactly similar lesions were present, has since come under my observation.

Case 2.—*Acute lymphatic leukæmia, with a similar lesion in the gums, epiglottis, and larynx to that which was present in Case* 1.—The patient was a labouring man, æt. 33, who was admitted to the Edinburgh Royal Infirmary on Saturday, September 29, 1901, and who died on Sunday, September 30, 1901. He complained of shortness of breath on exertion, of deafness, and of glandular swellings on each side of the neck and jaw. The deafness had commenced a month previously, but he had continued his work as a labourer until three days before his admission to the hospital. He was a thick-set, well-nourished, muscular man. There was no anæmia; in fact, his face and lips were turgid and cyanotic. No examination of the blood was made during life; but after death the blood was found to contain a large excess of lymphocytes, mostly of the large form. The patient was very deaf. His voice was husky and almost toneless, he was very short of breath, and the respiration was attended with stridor. Large, hard, painless, glandular swellings were present on each side of the neck, especially marked about the angle of the jaw; the face was swollen and blue; the veins of the neck somewhat engorged. I had seen the patient for a moment on his admission to hospital, but had not made an exhaustive examination of the case, and thought that the condition was suggestive of enlargement of the mediastinal glands with intrathoracic pressure. The case had been more carefully examined by Dr. Bell, house physician. The chest was full of bronchitic râles. The pulse numbered 108, the temperature was 102°, and the respirations 20. The tonsils were swollen and ulcerated. The patient died on the day following his admission to hospital. Post-mortem examination showed that the case was one of acute lymphatic leukæmia. The glands throughout the body were enlarged; the spleen, liver, and kidneys were infiltrated throughout with lymphoid cells; the bone marrow was of a dark purple colour, and infiltrated with lymphoid cells. In the skin of the back of the neck there were several lymphoid deposits similar to those which were present in the first case. In the second case, a condition of the gums, tonsils, epiglottis, and larynx, identical with that in the first case, was present. One of the glands in the neck, in the second case, was on section found to be green in colour.

The second case was undoubtedly a typical example of very acute lymphatic leukæmia, with peculiar lymphoid infiltrations of the gums, tonsils, epiglottis, and, to a very limited extent, of the skin.

The two cases when taken together have an important bearing upon the pathology of chloroma. That disease is very rare, but it is probably much more common than is usually supposed. Many cases are no doubt missed. A case figured in a recent number of the *Medical Review of Reviews*, November 1901, p. 695, and described as a "Rapidly growing Tumour of the Orbit," was, I have no doubt, a case of chloroma. Some years ago a friend in Barbadoes sent me a photograph of a remarkable case of symmetrical sarcomatous growths of the orbits, with exophthalmos, which was probably a case of chloroma; it appears to be merely an exaggeration of a case of chloroma recently published by Rosenblath.[1] It is probable that some of the rare cases of so-termed perforating sarcoma of the skull, of which I reported a case a few years ago, are cases of chloroma. In August last I had the advantage of discussing the whole subject of chloroma with Dr. Dock, who has made a special study of the disease. Dr. Dock agreed with me in thinking that the case (Case 1, which I have just described) was one of chloroma. In all the recent cases of chloroma which have been examined exhaustively, the blood presented the characters of lymphatic leukæmia. In some cases, in which there was no excess of leucocytes, the character of the corpuscles had not been ascertained by stained films. Now, the case related shows that lymphatic leukæmia may be present when there is no excess of leucocytes. The question whether chloroma is a definite and distinct disease, or whether it is merely a variety of acute lymphatic leukæmia, is a very difficult one to answer—a good deal can be said on both sides. The peculiar location of the lesions in the orbits and skull bones, though they are not of course confined to these parts; the green colour of the tumours; the fact that, in some cases, the tumours are of cartilaginous consistency; and the fact that, in some cases, the bones (as in one of Rosenblath's recent cases) are eroded and perforated by the growths—are in favour of sarcoma or lympho-sarcoma rather than of lymphatic leukæmia. But the condition of the blood is highly suggestive of lymphatic leukæmia. The three cases which have been described seem to show that no hard-and-fast line can be drawn between acute lymphatic leukæmia and chloroma. Dr. Dunlop's case is a highly typical case of chloroma, with all the changes in the blood characteristic of acute lymphatic leukæmia. My second case is a typical case of very acute lymphatic leukæmia, with peculiar lesions in the gums, tonsils, larynx, and skin; and my first case seems midway between the two (Dr. Dunlop's case and my second case). The mouth lesions seem to be the same in all three cases. The whole question appears to turn upon the nature and definition of lymphatic leukæmia. Possibly the same condition of blood (95 per cent. or more of the white corpuscles being lymphocytes) may result from more than one pathological condition. But, practically speaking, lymphatic leukæmia and chloroma are the only known diseases in which such a condition of blood is present. Probably more than one disease is included under the term acute lymphatic leukæmia, or, at all events, different varieties of the disease exist. Certainly different cases of lymphatic leukæmia present considerable differences in their clinical history and course, and in the relative intensity of the lesions found after death in the bone marrow, spleen, and lymphatic glands respectively. In this connection I would next briefly describe (Case 3) a case of very acute lymphatic leukæmia which has occurred in my hospital practice during the past week; in it there is very little glandular change, but the lesions in the spleen and bone marrow are very marked. This case is very interesting because of a peculiar condition of the kidneys. Both kidneys are very much enlarged, and the cortical substance is infiltrated with numerous large hæmorrhages, the intervening substance being pale, exactly of the colour of very anæmic brain tissue; the left kidney weighed 18 and the right 14 oz. The peculiarity of the condition is that the urine, which was carefully examined on three separate occasions during the last three days of life, was pale and absolutely free from blood albumin. At the post-mortem, the bladder contained 14 oz. of very pale urine, the specific gravity of which was 1012; it was absolutely free from blood, and contained the merest trace of albumin, which was perhaps derived from the vesical epithelium. I shall next refer to a case (Case 4) of chronic lymphatic leukæmia in which there are enormous glandular swellings throughout the body, as well as enlargement of the spleen and very marked changes in the bone marrow. In conclusion, I must state that the present communication is merely preliminary. It has been impossible in the time at my disposal to attempt to discuss the subject of chloroma and its relationship to lymphatic leukæmia exhaustively. All I have attempted to do is to mention the chief clinical and pathological facts of the cases.

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[1] *Deutsches Arch. f. klin. Med.*, Leipzig, 1902, Bd. lxii. 72.

THE IMMEDIATE POSITION OF THE ARM AFTER REMOVAL OF THE BREAST FOR CANCER.

By THOMAS CARWARDINE, M.S. (Lond.), F.R.C.S., *Assistant Surgeon, Bristol Royal Infirmary.*

CUSTOM has much to answer for in surgery. It is my conviction that the practice of fixing the arm to the chest, after operations for the removal of the breast, is a bad custom, and answerable for much of the impairment of utility and of œdema of the arm which frequently ensue.

1. *Utility of the arm.*—A few years ago I took certain measurements of the axillary region in a number of females, which led me to forsake the adducted position of the arm in favour of the abducted position after the operation, and the results have been uniformly gratifying. Formerly the patients had a limited use of an arm bound to the chest wall by a firm scar, with difficulty in doing the back hair, and impossibility of abducting the arm to a right angle without scapular movement. Now they raise and use the arm with freedom, and reply that they can "do anything with the arm." One young lady, whose breast I recently removed together with all the thoracic portion of the pectoralis major, quite scorned the suggestion of possible difficulty in doing her back hair or scratching her "poll." Let us see what are the theoretical considerations which bear upon this question.

When the arm is raised, the armpit is triangular in section, the sides of the triangle being humeral and costal, and the base corresponding to the axillary fascia. When the arm is applied to the chest, the sides of the triangle are apposed and the base is obliterated. The extent of the opening out of the axillary triangle is accordingly governed by the following factors:—

In the first place the extent will be limited by the length of the axillary base, just as a pair of steps can be opened only to the extent permitted by the cord.

Another factor in the control of the axillary angle is the proximity of the base to the apex: the closer they are together, the wider the possible angle becomes. In the letter ⊳ the basal connecting line is about the same as that in ⊳, but the angle at the apex is much greater in the latter (Fig. 1).

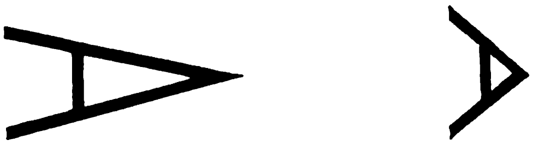

FIG. 1.

A third factor is the fixation of scar tissue to corresponding points. If the skin which should be apposed to an abducted arm be fixed to the chest by scar tissue, the movement of the arm will be much restricted.

It follows, therefore, that the best position for the arm, in order to give wide range of movement, will be that (*a*) which gives the longer base to the axillary triangle, (*b*) which approximates the base to the apex, and (*c*) which prevents the tissues being misapplied during the healing processes.

Now, it is at once obvious that the length of the axillary base will be much greater when the arm is kept at right angles than when applied to the chest after operation. In the adducted position the axillary base becomes limited or obliterated; and the extent to which this is so will be seen from the following table:—

Axillary Measurements of Twenty Females.

Observations.	Average (Inches).	Maximum (Inches).
1. ON ABDUCTION OF THE ARM—		
Skin of *thoracic* axilla becomes raised and apposed *to the arm* opposite the head of the humerus	1½ fully.	2 (in four individuals).
Skin of apex of axilla becomes raised	1⅛ „	1¾ (in two „).
Axillary border over pectoralis major rises	1 „	2 (in one „).
Scapular border over subscapularis rises	¾ – 1	1¼ (in one „).
Nipple rises	½	¾ (in six „).
2. ON ADDUCTION OF THE ARM—		
The axillary skin is drawn up into the axilla. (This also results as a reflex when the axilla is tickled) . . .	1	1½ (in two „).

The maximum measurements usually obtain in thin patients of full build.

Taking several points in the axillary base, we find that when the arm is raised the axillary base is increased by fully 1½ in. in the centre, by fully 1 in. over the outer border of the pectoralis major, and by rather less than 1 in. over the subscapularis. The nipple at the same time rises ½ in. The abducted position of the arm, therefore, gives the longer axillary base by fully 1½ in. at its central part.

Then, as to the approximation of the base to the apex—another of the factors in the range of movement—this requires careful consideration. If a normal arm be passively moved from the abducted to the adducted position, it will be observed that, by a provision of Nature, the skin of the armpit is simultaneously drawn up into the hollow, to the extent of 1 in., by the deep connections (see Table). The important point is, that these deep connections are divided in the process of clearing out the axilla, so that the skin is no longer drawn up naturally on adduction of the arm, but drops away from the axilla, baggy and puckered, being unsupported by dressings. But when the arm is abducted after the operation, the dressings uniformly press into the axillary space, approximating the base to the apex artificially, so predisposing to greater range of excursion of the axillary angle.

Then, again, as to the misapplication of tissues. On raising a normal arm, it will be found that the mid-axillary skin not only rises, but that a portion of the skin which was thoracic becomes humeral, *i.e.*, a portion of the skin covering the ribs becomes applied over the head of the humerus. It belongs, indeed, to the arm in abduction. If the arm be kept applied to the chest after operation, this area will necessarily remain costal, and the scar, instead of being fixed over the head of the humerus, will be affixed to the chest, so restricting movement by misapplication of tissue.

All three points in the argument are therefore gained by the abducted position. If it be retorted that this is mere theory, I would reply that the argument will be found much more convincing if the theory be put into practice. The theory and the practice of the abducted position are both good, and I have no intention of employing the adducted position again.

2. *Subsequent œdema.*—This is a frequent source of distress to the patient, and of disappointment to the surgeon, after extensive operations involving the axilla. It is particularly prone to occur when the arm has been bound to the chest with a care worthy of a better cause, and is less likely when there has been early use of the arm. My experience of the abducted position is that œdema of the arm is then much less, is of shorter duration, and is often conspicuous by its absence. But I did not fully realise why this should be so until recently, when I was called upon to do an extensive removal for recurrence involving the pectoralis major, the arm having remained œdematous for the two years subsequent to the first operation, when the arm had been applied to the chest. During the dissection the condition in Fig. 2 was strikingly apparent. The axillary artery was in its normal position, but the axillary vein was bound to the chest wall by a very firm band of scar tissue, kinking the vein, and dragging upon it in a very marked manner. Here was a case in which the œdema of the arm appears to have been caused by the axillary vein being

misapplied to the chest-wall and fixed thereto by firm scar tissue.

Why surgical tradition has it that the arm should be adducted and fixed after operation, it is scarcely possible to say. It was perhaps from the fancy that movement caused suppuration. Though wiser in our day and generation, the fancy remains as a fetish; the arm is fixed, and all the attendant evils endure. It is a practice against which I would strongly protest, as being anatomically, physiologically, and pathologically wrong, and would urge the universal adoption of the abducted position of the arm after removal of the breast. The apparatus is simple—a pillow on which to rest the arm, and a binder to fix the forearm to the pillow being all that are necessary.

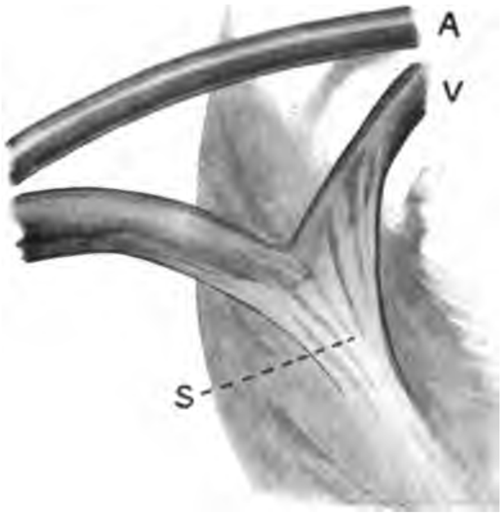

Fig. 2.—A, Axillary artery; V, Axillary vein; S, Scar tissue binding the vein to the chest wall.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

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Diseases of the Stomach and their Surgical Treatment. By A. W. Mayo Robson and B. G. A. Moynihan. London: Baillière, Tindall, & Cox.

The surgical treatment of diseases of the stomach is of such comparatively recent development that the literature may be said to have fallen behind the practice of the day. There is no book on the subject, and our standard works make but brief reference to it. Mayo Robson and Moynihan have been associated in hospital work for many years, and they both enjoy an enviable reputation in the special branch of surgery of which they write. We are therefore indebted to them for the opportune appearance of the volume before us, and we trust it will receive the recognition and appreciation which it deserves. An important feature in the work is the very large number of illustrative clinical cases, from which the reader may acquire experience of the greatest possible value. The illustrations chiefly consist of photographic reproductions of museum preparations; the remainder of the figures, although instructive, are singularly devoid of artistic merit. The text, although clear and concise, does not read smoothly, and does not lend itself to easy reference, and there is a good deal of overlapping under the different sections of the work. The subject is introduced by a résumé of anatomical considerations, and of the methods of examination in stomach cases. In the performance of exploratory operations, stress is laid on the advantages of the incision being made through the inner border of either rectus muscle, and of suturing the wound layer by layer. The pyloric obstruction of infants is discussed without making any addition to our knowledge of this ill-defined affection. Injuries are not satisfactorily differentiated into those which are subcutaneous and those associated with a wound of the belly wall, nor is any mention made of the results of swallowing corrosive poisons or of their later effects, such as stricture of the pylorus.

The main facts regarding cancer of the stomach are clearly stated, although the personal experience of the authors does not figure so prominently in this as in other sections of the work. Clinical observation does not bear out the statement, quoted from morbid anatomists, regarding the predominance (60 per cent.) of pyloric cancer. Many cases are erroneously regarded as originating in the pylorus which have really commenced in the vicinity of the lesser curvative, and subsequently spread towards the pylorus. In the matter of diagnosis, most surgeons will agree with the following statements: "Whenever a patient over 40 years of age complains somewhat suddenly of indefinite symptoms of gastric uneasiness, pain, and vomiting, followed by progressive loss of weight and secondary anæmia, the possibility of cancer should at once be recognised, and our only sure method of making the diagnosis in an early stage is by an exploratory operation." "Cancer of the stomach should be submitted to surgical treatment before a tumour is clinically recognisable." When cancer is discovered under these conditions, a radical operation should be attempted whenever possible, as the mortality is no higher than after a palliative gastro-enterostomy, and the functional results are immeasurably superior.

Kocher's method of resection of the stomach is regarded as the best; at the same time it is not always practicable, for it may be impossible to effect a junction between the duodenum and the portion of stomach which is left behind. The authors think it an open question whether complete extirpation of the organ "is a scientific operation or a brilliant exploit in surgical gymnastics." Scientific it may be, but certainly of little or no value in practice. We cannot agree that gastrostomy should be performed at the earliest moment in all cases of cardiac cancer; the operation frequently fails to prolong life or to add to the comfort of the patient, and we think it should be restricted to cases in which it is desired by the patient himself. It cannot be regarded as of anything like the same value as is colotomy in cancer of the rectum.

The chapters devoted to gastric ulcer and its complications are by far the most important in the book. The views expressed are already known to the profession, as they have been published in the Hunterian and other lectures delivered by Mayo Robson. Although prominence is very properly given to medical treatment, further experience confirms the authors in the opinion that "in the greater number of cases the surgical treatment of intractable or relapsing ulcer is the only satisfactory method, and operations should be resorted to at a much earlier period than has hitherto been the custom." Gastro-enterostomy is the routine operation, and its mortality has been reduced to 5 per cent.; thus comparing very favourably with that of ulcer exclusively treated by medical measures, which amounts to from 20 to 25 per cent. Pyloroplasty is restricted to cases of spasmodic obstruction, where there is no scar tissue, and where there are no adhesions. Mayo Robson's views regarding the treatment of hæmorrhagic for gastric ulcer are already well known.

The subject of perforation is discussed without any reference to other phenomena related to ulcer which may simulate perforation, namely, concealed hæmorrhage, and without any record of the complications which may ensue after operation, such as pleurisy, pneumonia, hepatic abscess, or embolism. We have observed death take place as long as six months after an apparently successful operation for perforation, multiple abscesses of the liver having formed, as a result of phlebitis of the portal vein starting in relation to a small focus of suppuration in the region of the spleen.

The subjects of perigastric abscess and of hour-glass stomach are fully considered. Congenital hour-glass stomach is described as certainly rare, and not improbably mythical. Considerable attention is devoted to tetany as an accompaniment of dilatation of the stomach, and a more hopeful view is expressed regarding the prognosis than that adopted by previous writers.

The last chapter, dealing with the various operations performed on the stomach, is chiefly valuable for the account given of the method of gastro-enterostomy as performed by the authors. Robson pins his faith to the posterior operation associated with the name of von Hacker, but modified in several useful details by himself. His experience, that it is never followed by the circulus vitiosus, is of great value, for it does away with the necessity of the additional entero-anastomosis which is so frequently practised by Mikulicz and other continental surgeons.

Alexis Thomson.

Epilepsy and other Chronic Convulsive Diseases: their Causes, Symptoms, and Treatment. By Sir William R. Gowers, M.D., F.R.C.P., F.R.S. Second Edition. London: J. & A. Churchill.

The well-known work upon epilepsy and associated disorders by Sir William Gowers, in this, the second edition, is a replica of the first in name and character only; every part of it has been subjected to revision, many parts rewritten, and much new matter added. That the revision must needs have entailed a large amount of careful labour, is attested by the fact that 3000 separate cases now form the source from which the statistical data included are derived, in place of the 1450 cases of the preceding edition. Of these 3000 patients, 52 per cent. were female, 48 per cent. male; of the first series the females formed 53·4 per cent., the males 46·6 per cent. of the total 1450; in the additional 1550, 50·7 per cent. were females, 49·3 per cent. males. A large number of important points are illustrated statistically, either from the total cases, or from varying, but always large numbers, in a few of the more special items.

After an introductory chapter, the etiology of epilepsy is discussed in all its bearings; the next three chapters are devoted to symptomatology. Then, in turn, organic epilepsy, hystero-epilepsy, morbid associations of epilepsy (heart disease, chorea, myoclonus multiplex, and migraine), its course, pathology, diagnosis, prognosis, treatment, and surgical treatment, are treated of in successive chapters.

The volume comes from so great an authority upon nervous diseases that it scarcely requires further commendation than such a statement.

The underlying motive of the work, consisting in the descriptive while statistical study of a large number of cases actually observed by the author, the different points connected with epilepsy, have necessarily to be, and in the majority of instances are, discussed in turn in relation to the results shown by the series.

It seems a pity that there are no more comprehensive tabular presentments of the main facts derived from the observations on the 3000 cases. Several small tables there are, indeed, each illustrating some separate point. One or two combined tables, whereby different factors could at once be compared and contrasted, would add to its value. For instance, details of sex, age, etc., not alluded to in connection with many of the different divisions of the subject in the text, might easily be shown by such means, and this to advantage.

Another thing which perhaps might have been enlarged upon at greater length, is the subject of alcoholic fits, both epileptiform and epileptic; even although only in 29 of the 3000 was alcohol apparently the primary agent. It is a work which profits one to read; which incorporates a valuable analytic study of epilepsy by a master of the subject; and is a monument to the energy and perseverance of its author.

A. Lockhart Gillespie.

Diseases of the Thyroid Gland and their Surgical Treatment. By James Berry, F.R.C.S. London: J. & A. Churchill.

In the preface to his book Mr. Berry says: "I trust that those who read the book will deal gently with it, and remember that it is an honest attempt to set forth as clearly and concisely as possible what is known by myself and others about a difficult and somewhat obscure branch of surgery."

Readers of the book will think this a modest estimate of what is one of the best surgical monographs that has been written. The book throughout bears the impress of thorough, careful work, done by an able, experienced, and enthusiastic surgeon, who can form and express clearly the opinions which his exceptional experience and skilful use of it have led him to adopt. The following is a sample of the manner in which each portion of the subject has been treated. After discussing fully the conditions said to give rise to goitre, and going over each claim advanced, and the reasons why it should or should not be accepted, the chapter ends thus:—

"Summing up, there can be no doubt that climatic and atmospheric conditions have little or no share in the causation of goitre. That want of air and sunshine has absolutely nothing whatever to do with it is equally certain. Habits, such as carrying weights on the head, violent exertion, and the like, play but a secondary part in the production of the disease. That heredity is a cause of goitre is extremely doubtful. Intermarriage has certainly no share in its causation.

"That there exists some definite relation between endemic goitre and some poison in the soil upon which it is found, is tolerably clear, and there can be no doubt that in the vast majority of cases drinking-water is the vehicle by means of which that poison obtains access to the body. Such water is usually, if not always, derived from calcareous soils, but it is probable that the goitre-producing poison is not a salt of lime or magnesia. It has not yet been proved satisfactorily that any salt of iron is the essential constituent. The same may be said of micro-organisms."

Chapter I. deals with the anatomy of the thyroid gland. The presence of a distinct though delicate capsule investing the gland is emphasised as an important surgical fact. This is of more than usual interest to us, as we can recall that more than a quarter of a century ago the same knowledge was the foundation of the pioneer work of Dr. Patrick Heron Watson, who introduced the modern safe operation for removal of the thyroid gland.

The anatomical relations of the recurrent laryngeal nerve and of the gland itself are carefully given; the vesicular supply and position of the blood vessels are fully described; the pyramid and its variations especially are dealt with in such a manner that the reader feels satisfied, after a perusal of this chapter, that he has obtained much useful information not easily accessible elsewhere. The parathyroids, which have recently attracted considerable attention, are dismissed in a short sentence describing their position and their lack of vesicles containing colloid, and their function as being held by some to be different from that of the thyroid gland itself.

In the following chapters the diseases common and rare are fully described, and emphasised by illustrative cases and specimens removed from them. At the end of the book the surgical treatment is dealt with in the fullest possible way, every attention being paid to the most minute detail.

We think that for a long time this book will constitute the guide to surgeons in the treatment of diseases of the thyroid gland, and we have no hesitation in saying that every one who is interested in this subject ought to possess himself of it. RUTHERFORD MORISON.

The Physiological Action of Drugs. An Introduction to Practical Pharmacology. By M. S. PEMBREY, M.A., M.D., and C. D. F. PHILLIPS, M.D., LL.D. London: Edward Arnold.

THE comparatively simple structure of the nervous system in the frog, and the fact that its muscles, heart, and peripheral nerves retain their functional activity after removal from the body, make these tissues and organs especially suitable for studying and analysing the actions of drugs on them. It is true that the deductions from such experimentation are not always applicable to man and other mammalia, but they have proved of great service in systematising our knowledge of the action of remedial agents, while the simpler conditions of experiment as compared with mammalia tend to give us a clearer and broader idea of the fundamental actions of drugs. It is with the view of furthering these objects that Drs. Pembrey and Phillips have prepared and published the present little volume, in which they describe a large number of experiments which may be performed on pithed frogs or on isolated organs. It is needless to say that the authors show a thorough grasp of this part of pharmacology, and that they give such clear and practical directions for preparing the experiments that any one with an elementary knowledge of physiological methods may repeat them for himself. The book, in fact, is admirably suited for self-instruction. It begins with a short series of introductory experiments on the methods to be employed, and this is followed by explicit and detailed directions for investigating the actions of all the more important muscle and nerve poisons, such as alcohol, chloroform, various alkaloids, digitalin, and extract of suprarenal gland. Numerous excellent heart tracings and some muscle tracings are given to illustrate the descriptions. The volume is well arranged, and it is to be hoped that it will stimulate the interest taken in the pharmacological action of remedies. RALPH STOCKMAN.

Studien über die Narcose, zugleich ein Beitrag zur allgemeinen Pharmakologie. Von Dr. E. Overton, Zürich. Jena: Gustav Fischer.

Dr. Overton has put together in this volume the results of eight years' observations on the action of narcotic substances on the cells of animals and plants. The whole forms an interesting contribution to the sciences of biology and pharmacology, and to the wide subject of cell physiology. About a third of the volume is occupied with a critical account of the different theories of narcosis, the remainder being devoted to a description of the author's own experiments and observations. The term narcosis is understood by Dr. Overton in a very wide sense, as comprehending the action of all the important substances which depress the nervous system, and as including anæsthetics, hypnotics, phenols, camphor, essential oils, phenacetin, carbonic acid, and a host of other bodies. The experiments have been carried out chiefly on invertebrata, such as tadpoles, insects, crustaceans, and protozoa. The actions of chloroform and ether are described in detail, while the other substances are considered more shortly.

The author divides all narcotics into two groups—the indifferent and the basic, all the members of which are capable of being comparatively rapidly absorbed and rapidly excreted from the living cell. The indifferent narcotics act by combining with the lecithin and cholesterin constituents of the cell, and so altering its function, while the basic substances (alkaloids) seem to form a salt-like combination with the albumins. The latter are more permanent than the former, hence the resulting effect is more prolonged. Various other subsidiary causes of narcosis are also described by the author. The questions involved are too complex to be discussed in an ordinary review, but the book forms a valuable contribution to the subject, and is well worthy of attentive study.

Ralph Stockman.

Principles of Surgery. By Nicholas Senn, M.D., Ph.D. Third Edition. Philadelphia: F. A. Davis Co.

The rapidity with which this work has passed through the first and second editions suffices to indicate the great popularity of the book; and, so far as we can judge, it well deserves that popularity, for it is full of interest from beginning to end.

The student will find in this work present-day knowledge regarding the most important infective diseases in the domain of surgery. The characteristic morbid processes observed in these diseases are fully described, the immediate causes are disclosed, and the indirect influences are not neglected; the possible as well as the probable and positive avenues of infection are considered and exemplified, and the general lines upon which treatment may be successfully conducted are given clearly and explicitly.

The characteristics of bacteria, together with their natural history, are exhaustively dealt with, and their rôle in the production of disease receives that degree of attention which is now known to be necessary.

Many terms are defined, but often, a few lines further on, the context shows clearly enough how inadequate such definitions prove themselves to be. For illustration, it may be mentioned that to define inflammation adequately means describing the process, its negative as well as its positive features; and it need hardly be asked, how can this be done in a few words, however concisely arranged? This is, however, a small matter, and only serves to emphasise the excellence of the work as a whole.

The present edition contains two new chapters, one dealing with that ever-interesting process—regeneration of tissues, and the other describing a skin affection—blastomycetic dermatitis, which from the description alone it is difficult to recognise, and which, unless it be known under some other name, is rare in the British isles. The author has done well to differentiate between the processes of healing and those observed in inflammation, for they differ in kind rather than in degree, as has been assumed of late years.

It seems to us that Professor Senn lays too much stress upon relating, however briefly, the views of the many writers on any particular subject. A judicious elimination of some of these views would likely prove of advantage to the student.

The world-wide reputation of the author is well maintained in this his test publication. JOSEPH GRIFFITHS.

A Handbook of Hygiene. By A. M. DAVIES. Second Edition. London: Charles Griffin & Co. Ltd. 1901.

THE first edition of this book was published in 1894, and has no doubt served a useful purpose as a compendium of the essentials of hygiene in a handy and portable volume. The present edition contains some new matter, but it cannot be regarded as an authoritative guide or text-book upon the subject. The author, while bringing together a mass of information, does not assist the reader to discriminate the good from the bad, nor does he sound a certain note upon many questions of importance and difficulty in practical sanitation. The general rules for the prevention of infectious disease (p. 519) are stated to be partly derived from Dr. Bristowe's "Treatise on Medicine," 1890. We should have thought that the author might safely have ventured, in a "Handbook of Hygiene" of the year 1901, to have given a more definite pronouncement as to the necessity of isolation in a hospital for infectious diseases under this heading. We notice also that the hanging of a sheet outside the door of the sick-room, wetted with some disinfectant solution (amongst others, Condy's fluid!) is advised. What advantage has a sheet wetted with Condy's fluid over one soaked with plain water, and, if any, what strength of disinfectant solution does the author recommend?

The author is not at home in dealing with sanitary appliances and drainage. His views on the subject of disconnecting or intercepting traps are not quite clear, as the following quotations indicate:—

"The disconnection between the house pipes (soil, sink, or bath waste pipes) by means of an intercepting trap has been already described; a manhole and inspection chamber serves the same purpose on a larger scale." And again: "At the point of connection between the house pipes and the drain pipes, free ventilation of the former is of the utmost importance, and may be effected by one of the numerous forms of disconnecting or intercepting traps, or on a larger scale by a manhole." Another statement we do not understand is: "Sewers are either drain sewers or pipe sewers," etc., p. 361. We should strongly advise a revision of the differential diagnosis of CO and CO_2 poisoning on p. 30, if the author considers this question a suitable one for introduction into future editions. HARVEY LITTLEJOHN.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,
MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

RECENT METHODS FOR ESTIMATING RENAL INSUFFICIENCY—KRYOSCOPY, METHYLENE-BLUE, PHLORIDZIN.

KISS, *Berl. klin. Wchnschr.*, 1901, Nos. 47, 48; *idem, Deutsche med. Wchnschr.*, Leipzig, 1901, Nos. 17, 18; DRESER, *Arch. f. exper. Path. u. Pharmakol.*, Leipzig, Bd. xxix.; KORÁNYI, *Berl. klin. Wchnschr.*, 1901, No. 48.

KISS is doubtful whether any of the recent methods which have been devised for, and bepraised in, the diagnosis of renal insufficiency and the estimation of its degree, are of real value. The recent adoption of kryoscopy, for instance—the estimation of the molecular concentration of a solution, by determination of its freezing point—is a case in point. Dreser investigated the question in relation to differences between the molecular concentration of the blood and urine, and sought to show that divergences between the two represented the work done by the kidney in the excretion of the urine. This he thought to establish by means of complicated formulæ, not free from mathematical fallacies.

Dreser estimated the daily work of the kidneys at from 70 to 240 kilogram-metres; 500 to 1000 times less than that of the heart.

Koranyi offers a simpler plan for the interpretation of kryoscopic results. He uses the formula, $\frac{\Delta}{\text{NaCl}}$, where Δ is the temperature at which the urine freezes, NaCl the proportion of that salt contained in the same. From direct observation, he finds the equivalent of this formula to vary between 1·23 and 1·69, and to be fairly constant in each individual.

Kiss combines determination of the exact specific weight of the urine with that of the freezing point, and the formula $\frac{\Delta}{S-1}$ (where Δ is as above; S, the specific gravity of the urine) expresses the factors employed. In twenty healthy persons the corresponding values varied between 63·8 and 84·6; in twenty patients, between 43·3 and 89·9. The clinical value of kryoscopy certainly seems nebulous, while its scientific worth is as yet obscure.

Kiss proceeds to criticise the comparatively recent methods for determining the degree of renal insufficiency by means of methylene-blue and of phloridzin, and this adversely; stating that the results obtained are unreliable, the conclusions drawn from them untrustworthy; even when catheterisation of the ureters is performed, and the relative characters of the urine secreted by each kidney separately are determined. The excretion of methylene-blue by the kidneys, and of sugar after administration of phloridzin, so often fails to correspond with the actual conditions present, as ascertained by other means, that errors in judgment based upon it are unavoidable.

EMULSION-ALBUMINURIA.

CRAMER (*München. med. Wchnschr.*, January 21, 1902) had already met with two cases of milky urine, passed shortly before death from puerperal eclampsia, in which the milky appearance arose not from any admixture of fat associated with chyluria and lipuria, but due to some proteid substance in an unusual physical state. Last year a third case fell under his observation, similar in most points, except for the fact that it was not of puerperal origin. Here again, shortly before death, the urine voided was milky. Neither warming, nor addition of acid, nor filtration, removed the milky appearance of the urine. Innumerable globules of the most minute size could be detected under high powers of the microscope. When water was added to excess, a few drops of acetic acid or of liquor potassæ reduced the milky condition to one of opalescence only. Heating the mixture hastened this change; water added to great excess produced the same result. On boiling, a copious precipitate was obtained, with disappearance of the opacity. Ether extracted no fat; osmic acid failed to give any indication of fat. Artificial peptic digestion cleared the urine; HCl alone did not. Independently of the milkiness, uric acid crystals separated out in considerable number. After heating with 1 per cent. HCl for one hour, a crystalline deposit was obtained, which was identified as allantoin on analytical investigation. According to the author, no other instance of milky urine due to native proteids, similar in nature to the three observed by him, is to be found in medical literature.

[Byrom Bramwell and Noël Paton gave details of a case in which a copious precipitate of some variety of globulin in crystalline form was present in the urine; the urine, however, was not milky.—*Rep. Lab. Roy. Coll. Phys. Edin.*, vol. v.—A. L. G.]

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

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CARCINOMA OF THE MALE BREAST.

THE greater frequency of carcinoma of the breast in females, as compared with males, is doubtless to be accounted for by the structural and functional changes which the female gland undergoes in association with menstruation, lactation, and the menopause. Up to 1890, Schuchardt had collected 472 cases of carcinoma of the male breast. In the paper before us, Warfield has collected those published since 1890—thirty-two in number—and has added notes of five new cases, making in all 509 recorded cases. These figures would make this disease appear to be much rarer than it really is. The statistics of different observers vary as to its relative frequency in the two sexes, some tables showing it to be 100 times more common in women than in men, others 150 times. The youngest male in whom it has been met with was 12 years old, the oldest 91. Imbert observes that in those males who have cancer there is an abnormal development of the breasts, and he thinks that there is a relation between hypertrophied breasts and cancer. In males, pain is less frequently a prominent symptom than in females. Ulceration, however, is very common, the tumour becoming adherent to the skin, which becomes thinned out and purple, with enlarged veins coursing through it. Retraction of the nipple is a constant sign in males, doubtless because the gland is so small that the tumour is always closely related to the nipple. In all other respects there is practically no difference between the condition in the two sexes. All the varieties of cancer met with in women occur also in men, but it appears that the atrophic scirrhous form is more common in the female. One of Warfield's cases is of considerable interest. A man, æt. 47, stated that when 19 years old he slipped on a fence and struck his left breast. A month later he noticed a small lump—about the size of a pea. It gave him no pain or inconvenience till he was 44, when it began to increase somewhat rapidly. Two years later he accidentally cut it with his braces, after which it became painful and grew more rapidly. The skin became adherent to the lump, and the nipple was retracted. Some months later he discovered a painless lump in the axilla. Meanwhile he was losing weight. Complete excision of the breast and glands was performed in September 1898. The following month he complained of paroxysmal shooting pains in the epigastrium and around the xiphoid. A month later he complained of stiff back, and girdle pains along the course of the ninth and tenth ribs. There was marked rigidity of the back, but no deviation of the spine. Three months after this he began to have trouble with his bladder; he had dribbling of urine from an over-distended bladder, and was troubled with priapism. He developed complete paresis of both legs, and there was dulling of sensation to pain and touch. A prominence could be detected over the spine from the sixth to the ninth dorsal vertebra, and a localised swelling over the eighth spinous process. Bedsores developed, and he gradually sank and died five months after the operation. On post-mortem examination, no metastases were found in the internal organs, but in the sternum, ribs, and vertebræ secondary deposits were found. These were in the interior of the bones, and were surrounded by a thin shell of bone. Opposite the body of the seventh dorsal vertebra a mass projected towards the spinal canal and compressed the cord, which was softened and narrowed to about one-half its thickness. The original tumour and the secondary deposits showed exactly the same structure—a *carcinoma simplex*. A useful bibliography is appended to this paper.—*Johns Hopkins Hosp. Bull.*, Baltimore, Oct. 1901.

LUMBAR PUNCTURE IN FRACTURES OF THE SKULL.

AN interesting discussion took place at the December meeting of the Société de Chirurgie of Paris on the use of lumbar puncture in fractures of the skull. Poirier reported a very instructive case of fracture of the skull, in which, on making a lumbar puncture, about 35 grms. of cerebrospinal fluid, strongly tinged with blood, escaped in a forcible jet. The patient's condition was considerably improved almost immediately. Some days later, evidence of the basal fracture, in the form of paralysis of the sixth pair of nerves, and subconjunctival ecchymosis, manifested itself. At the end of a fortnight the patient left the hospital cured. Rochard, in two out of three cases in which he employed this measure, observed phenomena identical with those reported by Poirier. Tuffier has made the puncture ten times, and has found the fluid withdrawn stained with blood. It is possible, he says, to have the fluid tinged in cases of cerebral hæmorrhage. Guinard expressed the opinion that lumbar puncture has a therapeutic value in all cases in which the intracranial tension is increased. (See also abstract in Journal for Dec. 1901.) —*Progrès méd.*, Paris, December 14, 1901.

INTERSTITIAL INGUINAL HERNIA AND ITS TREATMENT.

PAUL BERGER sums up an exhaustive paper on interstitial inguinal hernia and its treatment by radical cure with the following conclusions: —(1) The term "interstitial inguinal hernia" in the male should be reserved for cases of congenital herniæ complicated by malposition of the testis, in which the hernia spreads itself out in the substance of the abdominal wall between the musculo-aponeurotic planes. (2) Of these herniæ there are two varieties: one in which the hernia is entirely intraparietal, the other in which a prolongation passes out of the external abdominal ring—that is, a combination of intraparietal and scrotal. (3) The intraparietal part of the sac usually extends as a finger-like process outwards towards the anterior-superior iliac spine, and has often all the characters of a congenital sac. The scrotal prolongation is sometimes so narrow that nothing can enter it. (4) The external abdominal ring usually remains closed, but in the combined intraparietal and scrotal form it is usually permeable and may even allow the testicle to pass through. (5) The internal abdominal ring is often situated higher up and further out towards the iliac spine than normal. It is necessary to distinguish these cases from those in which the internal ring has been pushed towards the abdominal cavity by taxis. (6) Between the internal and the external rings the sac spreads itself out between the transversalis fascia and the aponeurosis of the internal, less frequently of the external, oblique. Sometimes even a process passes between the fascia transversalis and the transversalis muscle. These cases simulate pro-peritoneal herniæ. (7) The position of the testis in relation to the sac varies. It may be absent, and the hernia is complicated with cryptorchidism. In most cases the testicle is fixed either in the neighbourhood of the internal abdominal ring or just outside of it. It may be in the canal or even at the external ring. In the combined intraparietal and scrotal variety the testis may occupy the scrotal pouch of the sac. (8) The testis is almost always imperfectly developed. (9) The cord is often short, and even after dividing the cremaster muscle and fascia around it, it cannot be sufficiently lengthened to enable the testis to be placed in the scrotum. (10) It must be admitted, however, that in certain rare cases the testis as it lies in the inguinal canal is enclosed in a separate vaginal process, and that it may even reach its proper position in the scrotum, the interstitial hernia being developed behind it. (11) Both varieties of interstitial hernia are met with in the female. (12) On account of the dangers attending this form of hernia, and the extreme difficulty of reducing it and retaining it in position, unless there is some special contra-indication, all cases should be operated upon, even if the patient is well up in years. (13) The hernia is exposed through an oblique incision parallel to Poupart's ligament. (14) The testis is only to be conserved in cases where it is well developed and has not undergone atrophy, and where it can easily be placed and retained at the bottom of the scrotum. (15) In adolescents and children an attempt may be made to save the testis, even in circumstances more or less unfavourable, but in patients over 25 it should be removed, as otherwise the results are not satisfactory. (16) The repair of the abdominal wall should be carried out with great care, the different layers being sutured separately. This paper contains very full references to the literature on the subject.—*Rev. de chir.*, Paris, January 1902.

THE CAUSE OF STITCH ABSCESSES AND THEIR PREVENTION.

A. ERNEST MAYLARD suggests a new method of preparing the skin prior to operation, by inunctions of oleate of mercury. He accepts the evidence of Lockwood, that sterilisation of the skin by means of ordinary watery antiseptic solutions is apparently impossible. Theoretically, therefore, the edges of every wound and the channels made by stitches are infected by the micro-organisms which normally infect the secreting glands and lymphatics of the skin. By securing accurate apposition of the edges of the wound, and preventing the accumulation of fluid, or by establishing drainage when this is impossible, the risks of sepsis being set up by the bacteria of the skin may be reduced to a minimum. It is otherwise with the stitch tracts. If silk is used for sutures, cells and fluids percolate its fibres and serve as a medium in which organisms from the skin may flourish. The tension of the stitch devitalises the tissue through which the silk passes, and may even form a zone of necrosis in which these organisms find an admirable nidus. In this way abscesses in the line of the stitch and in the tissues underneath the skin may be explained. Maylard's method of disinfecting the skin is based on the fact that mercurial ointments are readily absorbed through a skin surface—most probably by the lymphatics. He argues that if these channels are impregnated with such a potent antiseptic as mercury, at the time of operation, the organisms of the skin, if not actually destroyed, will at least be inhibited sufficiently long to enable the tissues to repair before they again recover their power of doing harm. The skin is first thoroughly purified in the usual way with soap and water, turpentine and spirit, and after being dried is freely anointed with hydrated lanoline containing 20 per cent. of oleate of mercury. This is well rubbed in for five or ten minutes, and the part is then covered with a piece of lint smeared with the ointment. At the end of twenty-four hours the part is again rubbed with ointment and covered with lint as before. Every case should be treated for at least twenty-four hours—preferably forty-eight. On the operating-table the piece of lint is removed and the superfluous ointment rubbed off with a piece of sterilised gauze, after which the part is ready for operation. The author has not met with any symptoms suggestive of absorption of the drug, even when wide areas have been treated in this way. Incidentally, the author refers to that other inevitable source of wound infection—the surgeon's hands. In purifying the hands, he lays great stress on the importance of thorough mechanical washing in water as hot as the surgeon can bear it for five or ten minutes. The effect of this is to dilate the capillary vessels and excite into active secretion the sudoriferous and sebaceous glands, and so remove their contained organisms. The hands are then washed in the ordinary way with soap and water, and rinsed in warm carbolic lotion (1 in 40). He considers that frequent rinsing of the hands during the course of an operation is important to remove bacteria which are constantly being expelled from the glands of the skin.—*Ann. Surg.*, Philadelphia, January 1902.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Arrest of Natural Respiration Five and a Half Hours before Stoppage of the Heart in a Case of Eclampsia.

Bidone (*Ann. di ostet.*, Firenze, 1901) publishes a report of a remarkable case which occurred in his practice. The patient was a multipara, seven months pregnant, and was seen by him for the first time in a condition of eclamptic coma. The patient's respirations, which at first were regular, ceased to be so, and then stopped, the pulse at the same time becoming slower and weaker. Artificial respiration was begun, with the result that cyanosis disappeared, but no return to consciousness followed. In order to save the woman's life, Cæsarean section was performed, and a dead fœtus was removed. During the operative procedures artificial respiration was continued, the heart still beat with regularity and considerable force. No return to consciousness manifested itself, and finally, after five and a half hours of artificial respiration, the patient was allowed to die, owing to the physical prostration of the attendants, which prevented them from continuing the process any longer.

Severe Vomiting.

Kolipinski (*Med. News*, Phila., October 1901) advocates the use of small doses (a wine-glassful) of lager beer in cases of severe vomiting occurring in pelvic and abdominal diseases, nervous disorders, or acute infections in women. The dose may be repeated in half an hour, if necessary. He prefers the dark- to the light-coloured varieties of the beer.

CARE OF THE BREASTS WHILE NURSING.

BARKSDALE (*Charlestown Med. Journ.*, September 1901) recommends that when tender the nipples should be painted with a mixture composed of equal parts of glyceride of tannin and alcohol for several days. If fissures develop, he considers that they had best be treated by tinct. benzoini co. If symptoms of abscess formation in the breasts appear, all the milk should be drawn off, and the parts thoroughly massaged. If the symptoms are not now relieved, the breasts should be rubbed with an ointment composed of camphor, opium, atropine, and lanoline. The bowels should be freely evacuated; for this purpose he considers pulv. jalapi co. the best medicine.

THE MENSTRUAL FUNCTIONS.

MERLETTI (*Ann. di ostet.*, Firenze, 1901) publishes a long article on the menstrual function. In it he considers the conditions which favour or retard the appearance and disappearance of menstruation, the influence exerted by the general nutrition and hygienic surroundings of the individual on the amount of blood lost, the causes which produce physiological and pathological amenorrhœa. He also studies the relationship between menstruation and ovulation, oöphorectomy and amenorrhœa. His conclusion is, that menstrual hæmorrhage exists only while the organism has to dispose of a certain surplus of vital energy, necessary for the individual and for the preservation of the species, and that this surplus occurs only when a definite developmental standard has been attained. Physiological and pathological exhausting conditions cause amenorrhœa, independent of and sometimes in opposition to ovarian activity. He maintains that there is evidence, and specially clinical evidence, to prove that in the ovary lies a nervous centre which exercises a trophic and peristaltic influence over the uterus. The organic hyperactivity of the female induces an accumulation of nutritive products which, on account of not being utilised by the individual, would be injurious to it if retained, and are therefore thrown off periodically. The nervous centres give the first warning of the surplus, the vasomotor mechanism is now called into play, and a path is prepared for the liberation of the excess of nutritive products which, when removed, is followed by functional equilibrium. This explains why the activity of the changes and the vascular tension reach their maximum intensity at the beginning of menstruation, and become relieved when the flow is established. There are some women in whom the equilibrium of the organic functions is so perfect, that the retention and liberation of the excess of nutritive products cause no disturbances, but amongst the majority a certain amount of suffering occurs.

CASE OF OVARIAN TERATOMA.

GLOCKNER (*Centralbl. f. Gynäk.*, Leipzig, 1901, No. 37) publishes a report on a case where he removed an ovarian teratoma in which there was a large amount of nervous tissue. Hair, teeth, bones were all found, and in addition skin which, under the microscope, showed sebaceous and sweat glands, and also nerve tissues. In this, grey matter predominated; pyramidal ganglion cells were present, and a central canal lined by cylindrical epithelium. The ganglion cells resembled those found in the spinal gangliæ, while others were arranged in a similar manner to the sympathetic ganglia connected with the posterior roots of the spinal cord. Embryonic eye tissues were also found, such as choroidal pigment and cells resembling the granular layer of the retina.

THE SURGICAL TREATMENT OF RETROVERSION OF THE UTERUS.

HUIET (*Gynécologie*, Paris, August 1901) considers this condition chiefly from the intra-abdominal method of shortening the round ligaments. He considers that such a procedure is preferable to ventro-fixation, and further that the intra-abdominal method is better than that designated as the Alexander-Adams' operation, as, by the former method, adhesions and pathological changes in the appendages can be seen and dealt with; and, further, as the strongest portion of the round ligament, which is found nearest to the uterus, can be employed for fixation purposes. This holds specially true in the Doléri's operation, where the round ligament is passed through a slit in the peritoneum muscle and fascia of the anterior abdominal wall, and fixed to those and to the other round ligament, which has been treated similarly. Huiet considers that the operation should not be performed under the following conditions:—(1) Where the retroversion causes no symptoms; (2) where the retroversion can be corrected by use of a pessary; (3) where the condition can be rectified by proper massage; (4) retroversion complicated by prolapse of the pelvic visceræ. Labour and pregnancy, in the author's opinion, are less frequently interfered with by shortening the round ligaments than by ventro- or vaginal fixation.

THERAPEUTICS.

UNDER THE CHARGE OF

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SEROTHERAPY OF TYPHOID FEVER.

CHANTEMESSE, at the meeting of the *Société méd. des hôpitaux*, on November 8, made an important communication regarding the serotherapy of typhoid fever. The original serum made from the bodies of the bacilli proved only to have preventive but no curative action. Since then, however, a real antitoxine has been prepared by using toxine. In France the mortality from typhoid is 29 per cent. in adults and 10 per cent. in children. The total mortality for the years 1899 and 1900 was 18·5 per cent. Chantemesse has used his serum treatment in a hundred cases. All the patients injected before the tenth day recovered. In all, six died: three from perforation followed by peritonitis, and one from a sacral abscess, while two were injected too late. In the great majority of the charts the injection is followed in a short time by a fall of temperature, which usually does not rise again if the injection takes place before the eighth day. From the eighth day onwards the fall is more gentle, and is usually followed in a few days by another rise, requiring another injection before the final fall takes place. These results are of course subject to individual variations. The effect of the injections is very marked. The pulse becomes slower in a few hours. The diarrhœa disappears at the end of one, two, or three days. The blood pressure becomes normal, and polyuria is established. Twenty-four hours after the injection, leucocytosis occurs, and the eosinophiles reappear, while the neutrophyl myelocytes are replaced by the transition forms between the mononuclear and the polynuclear leucocytes. The injections are not painful or irritating. They should be made into the upper arm, where absorption is more rapid than over the abdomen. The first dose should be 12 to 14 c.c. Should the apyrexia not be complete, at the end of twelve days, another injection of 4 to 5 c.c. for mild fever, or 10 c.c. for high fever. The initial dose can be reduced to 10 c.c. when the disease is caught early, or if the infection has been very prolonged and severe, so that one fears a marked reaction.—*Gaz. d. hôp.*, Paris, November 19, 1901.

ACCIDENTS ATTENDING THE HYPODERMIC USE OF QUININE.

LAFFORQUE has used the injections extensively in malaria. The salt employed was the neutral hydrochloride. Using at first a solution of 7½ grs. in 17 minims of water, he found that certain accidents were liable to occur, such as abscess, scarring, or formation of fibrous nodules. The extent and gravity of these accidents depended to some extent on the general health of the patient, and on the severity of the malarial infection, but chiefly on the concentration of the solution. Not till the strength is reduced to 3 grs. per 17 minims can one be sure of avoiding local reaction. This was well shown in cases where the same amount of quinine was injected into the two flanks at the same time, but in different strengths; the strong solution causing abscess, while the weak solution only caused slight redness. The force and rapidity with which the injection is made also affects the reaction. The gentle injection allows the fluid to pass into the subcutaneous tissue without rupturing the tissue elements, which occurs if the injection is violently forced in. Slight friction dispersing the fluid aids absorption and diminishes the irritating effect. These frictions are specially indicated in collapsed cases where the circulation is weak and absorption slow. The least susceptible parts are those where the subcutaneous tissue is most abundant, and, at the same time, least dense. The most suitable are the gluteal regions and external surface of thighs, then external and outer surface of arms and dorso-lumbar region. The deeper the injection the less frequent and less severe the results. When deep injections cause irritation, it is due either to too rapid injection, or to the fluid being reflected to the surface from dense tissue underneath. Dilution does not diminish the efficacy of the quinine, as it is sure of absorption; in strong solution the salt is deposited in the form of a powder, which is only slowly absorbed. This has been demonstrated in rabbits. The action of quinine given subcutaneously is rapid, and the course of the disease is shortened. It enables us to administer the drug during the actual febrile attack.—*Gaz. d. hôp.*, Paris, November 14 and 19, 1901.

TREATMENT OF SEVERE ANÆMIA DUE TO GASTRO-INTESTINAL DISTURBANCE.

IN the first part of the article, Perutz discusses recent observations on the etiological connection between pernicious anæmia and chronic gastric and intestinal disorders. He points out that even yet there is no unanimity in regard to how much pernicious anæmia is due to derangements of the gastro-intestinal tract, whether these be of the nature of glandular atrophy or of the form of toxæmia. Still, clinically, absence of HCl and of the gastric ferments is constant, along with either constipation or diarrhœa. Consequently, in many cases recently, attempts to cure the disease have been especially directed against the gastro-intestinal condition. The case of Fleiner's which Perutz reports is a very instructive one from this point of view. An army officer suffered for over thirty years from gastro-intestinal disorders, which had latterly forced him to undergo treatment at various spas, without any real benefit. Still, up to two years ago, he was able to perform his duties. He then had to resign, owing to increasing weakness and attacks of breathlessness. A careful medical examination then showed that there was no HCl or ferment in his gastric juice. He was also diagnosed to be suffering from a blood disease. Shortly after this he came into Fleiner's clinic, suffering from general weakness, flatulence, bilious vomiting, and anorexia. Diarrhœa alternated with constipation. The hæmoglobin was 55 per cent., with commencing poikilocytosis. As the patient could not take arsenic, even hypodermically, treatment consisted of daily washing out of the empty stomach with a saline solution. In the evening rectal injections of camomile were used. Improvement was very rapid. The bowels were regulated, appetite returned, and in four weeks the patient returned home. After a few months' fair health there was a serious relapse. The Hb fell to 20 per cent. Hæmic murmurs were noted, with œdema and cardiac attacks. Poikilocytosis was now marked, and there was urobilin and indican in the urine. Under the same treatment comparatively rapid improvement took place, and in five weeks the Hb was 50 per cent., and the patient went home. Leading a quiet life, this has since risen to 80 per cent. The author considers that this is a typical case of severe anæmia dependent on gastro-intestinal glandular atrophy. The only tonic the patient could take was an alkaline muriated water and small doses of acid hydrochlor.

The stomach washing had chiefly a tonic effect, but might also have caused thorough flushing of the excretory organs. During the period of anorexia, and at a time when the patient could only be moved with danger, groats and eggs were introduced by the stomach tube. The rectal injection probably cleared the lower bowel of noxious products, otherwise the treatment was purely dietetic. To increase the appetite for meat, small quantities of anchovies and salted herrings were given shortly before the meals. Liebig's extract ($\frac{1}{2}$ drm. mixed with a little water) has a similar effect. Only at the very end of the treatment were drugs used, namely, fearatin, followed by quinine and arsenic.—*München. med. Wchnschr.*, 1902, No. 3.

PHYSOSTIGMINE IN ATONY OF THE INTESTINE.

VON NOORDEN points out that, although physostigmine has been extensively employed by veterinary surgeons as a subcutaneous means of purging, it is still very little used by physicians. In the course of the last year, Noorden had occasion to use the drug in four cases, which he publishes in order to call attention to the drug. The first case was that of a medical man who had for years suffered from slight cardiac symptoms, requiring occasional use of digitalis. Eight days after an operation for hernia, there developed within forty-eight hours, marked tympanites. Small motions and flatus were still passing. As the dyspnœa and cyanosis were serious, physostigmine in doses of $\frac{1}{66}$ gr. was given thrice daily. During the night enormous amounts of flatus passed, and next morning the abdomen was normal. In the next case of double salpingitis the severe meteorism and pain suggested peritonitis, but a diagnosis of reflex paralysis was made, and $\frac{1}{66}$ gr. physostigmine was given thrice daily. This was successful in four days. A relapse which occurred was cut short in twenty-four hours by renewed use of the drug. Another case was that of a woman who, after appendicitis, suffered from constipation with attacks of meteorism, which, as a rule, lasted several days. One which was treated by physostigmine was cured in four doses. The last case is in many respects the most interesting, as it shows that even in severe meteorism occurring during typhoid fever, physostigmine has a marked action. At first it was given in doses of $\frac{1}{133}$ gr. twice daily, which was gradually raised to $\frac{1}{66}$ gr. twice daily. No signs of intoxication developed, though $\frac{1}{15}$ gr. was given in three days. von Noorden used the salicylate of physostigmine, and recommends its administration in the form of powder, not as solution, which rapidly deteriorates. Should toxic symptoms occur, atropine is a good antidote.—*Berl. klin. Wchnschr.*, 1901, No. 42.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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FREQUENCY OF TYPHOID BACILLI IN THE BLOOD.

COLE (*Johns Hopkins Hosp. Bull.*, Baltimore, July 1901, p. 203) reviews the work hitherto done in attempts to find the *Bacillus typhosus* in the circulating blood, and then gives his own results. He refers among others to an important paper by Scholz and Krause (*Ztschr. f. klin. Med.*, Berlin, 1900, Bd. xli.), which was summarised in a previous abstract, shortly after it appeared. The authors, after discussing the isolation of the bacillus from the stools, urine, rose spots, state that cultures from the blood are of no value for diagnosis, since the bacilli are found in the blood only in rare cases. Neufeld, Curschmann, and Richardson, writing a little earlier, had also emphasised the frequency with which the bacilli were met with in the blood of the rose spots (not the circulating blood). Richardson, Gwyn, Horton Smith, and others, writing mostly in the early part of 1900, pointed out their great frequency (one case in four) in the urine; and, further, the bacilli have been found by several observers in lesions in almost every organ and bone of the body. It therefore seems probable that they must be present in the circulating blood in at least some stage of the disease. Cole undertook his investigations with a view to test this probability; and it will be seen that, if his results are found to be the rule and not the exception, the method will at once become of practical value as a means of diagnosis in certain cases. A note of his technique may thus prove useful. The skin over the anterior surface of the arm at the bend of the elbow was cleansed with soap and water, followed by alcohol, ether, bichloride of mercury (1–1000), and a hot compress soaked in the latter solution, applied for from half an hour to an hour. It was found that the hot compresses were of considerable importance in causing dilatation of the superficial veins. The bichloride was removed by sponging with sterile water. The hands of the operator are similarly sterilised, and the arm is grasped tightly below the shoulder by an assistant. The needle of a hypodermic syringe is quickly inserted into one of the superficial veins and 8 to 10 c.c. of blood withdrawn and divided among a number of tubes or flasks filled with bouillon; or, better still, Erlenmeyer's flasks, each containing 150 c.c. of bouillon. One to six flasks were used for each case, so that the dilution of the blood was from 1–75 to 1–150. The flasks were then shaken and placed in the incubator, and after twenty-four hours, if cloudy, agar plates were made. A still better method of drawing the blood is that described by James and Tuttle, and practised in the writer's laboratory at Birmingham, by means of a needle fitted upon a sterile glass tube of considerable calibre. It is described and figured by Dr. Emery in his handbook. The diagnosis of the *B. typhosus* was decided by motility, staining, growth on agar, glucose agar, gelatin, litmus milk, bouillon, Dunham's peptone solution (used for indol after one week's growth), and finally by agglutination (known typhoid serum, diluted 1 in 50, and duration, one hour, being used). In his total of fifteen cases, the *B. typhosus* was obtained from the blood in eleven; and from the last seven cases, in which a greater dilution of the blood was used, the bacillus was obtained every time. Five of the eleven positive cases died. On the other hand, three of the positive cases were very slight. In one of the negative cases (three separate inoculations proving sterile), which was of great severity, the patient aborted on the twelfth day, and the *B. typhosus* was actually found in the blood of the fœtus. The patient's urine also contained the bacillus. In all of the cases, except this and one other negative one, cultures were made on one occasion only. The positive results were obtained at various stages of the disease, most of them during the second week, the earliest on the sixth day, the latest on the twenty-seventh day, the latter being on the second day of an intercurrent relapse. In five cases the cultures were positive before the Widal test was obtained. In six cases out of twelve the bacilli were obtained from the urine. The cases were all clinically those of typhoid, excepting two, and in both the latter, while the Widal test failed, cultures from the blood succeeded, though too late to make the diagnosis during life. It is further interesting to note that the bacilli were found in the blood before the Widal test was present, in six of the cases altogether. Two other papers giving preliminary notices of results have likewise appeared, namely, Schottmüller (*Deutsche med. Wchnschr.*, Leipzig, August 9, 1900), and Auerbach and Unger (*ibid.*, December 6, 1900). In the former, out of fifty cases in which cultures were made from the blood during life, the *B. typhosus* was found in forty. He states that he used solid media and large amounts of blood, 15 to 20 c.c. In the latter, out of ten cases, the bacillus was found in seven. The authors used fluid media and small quantities of blood. The writer has not seen the full reports promised, if they have already appeared. These results seem to indicate that the *B. typhosus* is present in the blood with much greater frequency, and during a much longer time throughout the course of the disease, than was formerly supposed. The conditions which favour their presence have yet to be worked out. It has been contended that there is an antagonism between a large number of bacilli circulating in the blood and the Widal reaction; and this may be the case, as the bacilli can be cultured from the blood in a certain number of cases before the Widal reaction appears. This method would therefore appear to be of much clinical importance in diagnosis, particularly in cases where the Widal reaction is delayed.

THE COMPARATIVE VIRULENCE OF HUMAN AND BOVINE TUBERCLE BACILLI.

A SHORT reference was formerly made to some work by Ravenel on this important subject, and since then a much fuller paper by him has appeared in the *Univ. Penn. Med. Bull.*, 1901, vol. xiv. The experimental work consists of two parts — (1) isolation and study of pure cultures derived from various sources in man and cattle; (2) the study of the pathogenic power of tuberculous material of direct human and bovine origin. The method of isolating pure cultures was as follows:— Test tubes are fitted with a glass cap, ground on. A dog is bled into a jar, and the serum drawn off and distributed at once into the test tubes, under strict aseptic precautions, and the serum, to which 5 per cent. of glycerin is added, is coagulated at 76° C. Young tuberculous nodules from omentum, spleen, or glands are cut out, planted on the serum, and placed in incubators, at 37° C., for two to three weeks. Then the nodule is crushed against the glass, and the mass is rubbed over the serum. The nodules are best obtained from guinea-pigs, which are inoculated from the original matter—bovine and human. For the inoculation experiments, an emulsion of the serum culture is made with bouillon, and should show a turbidity equal to a twenty-four hours' typhoid culture. Inoculations were made from the second subcultures, subcutaneously, and into the peritoneum and lungs of various domestic animals. Of eighteen animals inoculated from the bovine source, fifteen died and three were killed; while of eighteen inoculated with human tubercle bacilli, only seven died and eleven were killed. *Guinea-pigs.*—All the animals inoculated died, though the human series lived about ten days longer than the bovine. *Rabbits.*—Those inoculated with human bacilli kept well, and showed no lesions, whilst those inoculated with bovine bacilli died with extensive tuberculous lesions. *Dogs.*—The bovine series died with general tuberculosis; the human were killed, and showed very slight lesions. *Horses.*—The horse inoculated intrapulmonarily from the bovine source was killed after six and a half months, and well-marked lesions, confined to the thorax, were found; whereas the horse inoculated from the human source showed slight local lesions, probably retrogressive. *Goats.*—Two goats inoculated in the lungs from the bovine source died in twenty-two and twenty-six days, and showed extensive tuberculosis of the thoracic organs; whilst the two inoculated from the human source continued well, and only showed a few nodules on the surface of the lung, containing cheesy pus. The mediastinal glands were enlarged and calcareous, and in one of the animals many mesenteric, etc., nodules were found. Some feeding experiments showed that human bacilli were more dangerous to puppies than the bovine, though both seemed equally dangerous to pigs. In further experiments made with the bovine and human tubercle, taken direct from the body, ground in a mortar, and suspended in starch water, the bovine tubercle proved much more virulent to most animals, but in the pig and sheep there was little difference. Human cultures recovered from pigs showed a marked increase in virulence over the original cultures. His general conclusion is the same as that previously come to by him, that bovine tubercle has a high pathogenic power for man as well as for domestic animals.

VALUE OF EXAMINATIONS OF THROAT SWABS AS A TEST OF FREEDOM FROM DIPHTHERIA.

AMYOT (*Canad. Pract. and Rev.*, Toronto, Dec. 1901, p. 680) contributes a short paper on this enormously important subject, in which he refers to the value of repeated tests in negative cases. Every bacteriologist working practically at this subject knows well that there is great need for wider knowledge, on the part of a large number of practitioners, in the interpretation of the results to be obtained from the bacteriological examination of throat swabs from cases of suspected diphtheria. How many of them are still unaware that a positive bacteriological result does not necessarily mean a case of diphtheria clinically, or that a negative result does not exclude diphtheria. Much good would be done if these and other similar facts were generally known, and hence the more salient points in Amyot's paper may be referred to here, even although they are not new. (1) He states that the reported results of over 6000 cultures taken from the throats and noses of people in apparent perfect health, and from as many varying sources as possible, give about 1 per cent. as showing the presence of the diphtheria bacillus. Thus it may be tentatively held that, of people living in cities and ordinary communities, and looked on as being in good health, about 1 per cent. probably have the diphtheria bacillus in their throats. (2) Other results taken from a series of people who were themselves in good health, but who had been in contact in one way or another with diphtheria patients, showed that about 14 per cent. of them had the bacillus in their throats. In all these cases, the bacilli either do not produce any toxine at all, or, if they produce any, it is immediately antagonised by the fluids of the body, and no disease is produced. The disease known as diphtheria only appears when the body shows a reaction to toxines formed by the diphtheria bacillus. Can such diphtheria bacilli, although powerless for harm to the individuals carrying them, do harm to others when transferred to them? In some such cases, the resisting powers may undoubtedly be less vigorous and the bacilli able to exert their specific action. We cannot cope with the cases occurring in the general population (1 per cent.), but we can cope with the majority of those exposed to infection (14 per cent.). All such persons, as well as those convalescent from diphtheria, should be controlled until their throats are found to be free from infection. Thirty days has been in the past the time, taking an average, that it has been the custom to hold the infected subject in quarantine, but repeated bacteriological examination is a better test to go by, as some are free in ten days, some in fifteen or twenty, and some not for much longer periods. Speaking generally, the thirty days' quarantine is too short for about 30 per cent. and too long for about 70 per cent. of the convalescent cases. To test the virulence of the bacillus in each case is hardly practicable, for it takes too long, at least ten or twelve days; and, further, it may develop virulence for another human although harmless to a lower animal. The writer thinks that vigorous local antiseptic treatment holds out much hope in such cases. The only safe position is to keep in quarantine all cases showing the bacillus until it disappears. Many able authorities allow such patients to mix with their fellows after a time, but this cannot be defended, as, though harmless in most, it may be dangerous in some. What is the procedure when the swab gives a negative result? Hill has shown, from the examinations of thousands of cases, that 30 per cent. of the cases showing a negative result in the first examination give a positive one on a subsequent examination. Consequently, a number of the Medical Boards of Health in America require that the patient should show a negative result on two consecutive days before being allowed out of quarantine. Even then it is said that a small percentage of error, 0·5, may appear. The great number of varieties of the diphtheria bacillus is another difficulty. Wesbrook has demonstrated nineteen varieties, and Hill has added a twentieth, in the shape of a branching form. Sometimes one, sometimes two, sometimes even ten of these are found in a single clinical case. In pure cultures of one variety, others are frequently found to appear. When separated out, their virulence varies, the largest forms showing the greatest, the smaller ones the least. Clinical cases are often observed to commence with the large ones and to end with the smaller. Amyot thinks that all of these should, at present, be looked upon as virulent, or, if not virulent, capable of becoming so. The average time of isolation when this plan has been adopted has been twenty-five days. The greatest possible safety to the general public is what we must aim at.

PHYSIOLOGY.

UNDER THE CHARGE OF

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INFLUENCE OF ARTERIAL BLOOD PRESSURE ON THE SIZE OF THE PUPIL, AND ON INTRAOCULAR PRESSURE.

THE question as to the influence of the arterial blood pressure on the size of the pupil has occasioned a good deal of controversy among those who have worked at the subject. Experiments performed on animals, clinical observation, and experiments on the cadaver, have led the various observers who have attacked the subject to very conflicting conclusions. Nagel held that the contraction of the pupil, following removal of the aqueous humour, was occasioned by the increased amount of blood in the vessels of the iris, as a result of the sudden fall in pressure. Tscherning regarded the contraction as due to mechanical dragging of the iris by the stream of outflowing fluid. According to Heine (*Klin. Monatsbl. f. Augenh.*, Stuttgart, 1902, Jahrgang xl.), it seems more probable that, although Tscherning's explanation may be partly true, the most important causal agent is the mechanical stimulus which the iris receives, producing contraction of the sphincter. The objection to this latter explanation, that the contraction occurs also in the eye under the influence of atropine, is hardly valid, because, in the first place, in all probability the atropine paralysis is not so absolute that it cannot be overcome by the strong mechanical stimulus (as it can in the case of inflammatory stimulation, *e.g.* in iritis); and, in the second place, it is quite probable that the muscle may be directly stimulated by the mechanical injury, even if the atropine nerve paralysis were absolute. Coccius gave the same explanation for the inspiratory mydriasis and expiratory myosis as Nagel gave for the effects of removal of aqueous humour. Mosso summed up the opinions of these investigators, when he used the expression "hydraulic movements of the iris." On the other hand, a number of able investigators expressed doubt as to the direct influence of the blood pressure on the pupil, especially François Frank and Jessop. Leber held that, although in his opinion Rouget's experiments on the cadaver proved that a complete injection of the blood vessels could markedly contract the pupil, and that the same might occur during life, still there was always the possibility that the hyperæmia at the same time might exert its influence through nervous channels (nerves of the iris). In 1856, Rouget carried out a series of investigations on the human cadaver. In more than thirty cases he produced marked contraction (one-third to one-half) of the previously dilated pupil, by complete injection of the vessels. Unfortunately, the writer gave no particulars as to the accompanying changes or to his method of experimentation.

Heine (*loc. cit.*) experimented first of all on the human cadaver. He inserted a cannula in the right carotid artery, and injected water under gradually increasing pressure. Until the pressure in the mercury manometer reached 200 mm., there was nothing to be noticed beyond an increased tension of the eyeball. Then moderate exophthalmos became evident, and a slight clouding of the cornea, while the pupil of the same side contracted from 6·5 mm. to 4 mm., and that of the other from 6·5 to 5 mm. The tension of the right eyeball was very much increased and that of the left showed a distinct rise. In the case of two other human cadavers the effect was much less marked—in fact, in one practically inappreciable. In similar experiments on the fœtus, and also on newly-born children, the injection being performed shortly after death, contraction of the pupil only occurred in two out of six cases. The fact that, even in the cases where the contraction of the pupil resulted, other factors beside the filling of the vessels came into play—for example, the effect of water and blood passing into the stroma of the iris—makes one suspect that even high arterial blood pressure *in vivo* is practically without influence on the size of the pupil. Heine, in the next place, experimented on animals, in order to find out whether it was possible to distinguish between contraction of the pupil, due to the purely mechanical factor of the increased arterial pressure, and that due to nervous stimulation. Instead of experimenting on the cadavers of animals, he tried to exclude nerve influence in the living animal in the following way. He exposed and cut the cervical sympathetic on one side in young cats, with, as a result, a typical sympathetic paralysis on that side. Four to eight weeks later, the eye on the affected side was for some days strongly atropinised. The result was a marked but not maximal mydriasis. A cannula was then inserted into the carotid of the same side, and an injection syringe, containing about 50 c.c. of Prussian blue, and a mercury manometer were connected. The tubing on the cannula was kept closed by a clamp until the pressure in the manometer stood at 300 mm., when the clamp was removed, and almost instantaneously the whole iris became blue. After about thirty seconds the iris on the same side showed slight, if any, contraction, while on the other there was very marked myosis. The solution which was injected was at the body temperature, and the animal was deeply under ether. It was thus upon the side where, although the pressure was highest, the nervous influence had been put out of play, that the least effect was produced, showing that the mere mechanical factor of the rise in arterial pressure is not the important one in the production of the pupillary contraction. Heine believes that in the living animal rise in arterial pressure does not influence the pupil.

Finally, the author refers to the influence of arterial pressure on the intraocular pressure. He inserted a Leber's cannula in the anterior chamber, and found that clamping the carotid only occasionally produced a fall of 1 to 2 mm. in the intraocular pressure. When the pressure of the fluid injected into the carotid was raised to 300 mm. Hg, the pressure in the anterior chamber began to rise, so that after ten seconds it had reached 100 mm. Only fifteen seconds later was contraction of the pupil to be noticed. In the case of rabbits the intraocular pressure in the eyeball on the opposite side to that where the injection was taking place showed no rise, although there was marked contraction of the pupil. This also is an argument against the mechanical factor of the filling of the blood vessels affecting the size of the pupil.

It is well known that marked contraction and dilatation of the pupil can be produced in animals without the intraocular pressure being in the least affected; and, on the other hand, one may artificially raise or lower the intraocular pressure without altering the size of the pupil. If contraction or dilatation of the pupil be produced, it is from the side of the nerves, and can be explained simply and alone by a contraction or relaxation of the sphincter or dilator pupillæ.

Permeability of the Renal Cells.

Cushny (*Journ. Physiol.*, Cambridge and London, vol. xxvii. p. 430), in a very interesting paper, discusses the subject of the permeability of the renal cells, especially for chlorides and sulphates, in order to discover whether the action can be best explained on the Ludwig or Heidenhain hypothesis. At the beginning of his paper he draws attention to certain of the difficulties that arise if the Heidenhain theory be accepted. He injected into the jugular vein in the rabbit a warmed mixture of chloride and sulphate of soda, containing an equal number of their respective acid radicles. A cannula was inserted into the bladder, and the urine collected for two to three hours, so that rate of secretion and subsequently composition of the urine might be investigated. In the first experiment there was a marked diuresis. The maximal chloride excretion coincided with the maximal diuresis, and then rapidly fell, the two curves following one another closely from the outset to the finish. The sulphate rose in absolute amount, immediately after the injection began, reached its maximum about the same time as the chloride, then fell more slowly. Although all the chloride and sulphate that was injected was not excreted at the close of the experiments, and there must have have been an excess of chlorides in the tissues, yet the urine at that time was practically free from chlorides. The most important part of his work has reference to the relative amounts of chloride and sulphate in blood serum and urine at different stages of diuresis. Thus the chlorides of the urine, secreted in the early stages of diuresis, stand to the chlorides of the plasma in the ratio of about 2:3; in the last stage 1:5; while the sulphate of the urine in the first stage bears the ratio of 2:1 to that of the plasma, in the last, 10:1. It is difficult to explain this by Heidenhain's hypothesis, as it is scarcely probable that the cells can differentiate between the two salts in solution. The proportion in which they are excreted is determined by the proportion in which they enter the cells, and as the proportions in the urine are not dependent on their relative amounts in the blood, it is more feasible to regard the tubules as affecting the composition of the glomerular secretion by absorbing varying quantities of its constituents. Thus it is only necessary to assume that the tubules absorb the sulphates with greater difficulty than the chlorides. In the early stages of diuresis, when the flow of urine is at its height, absorption by the tubules does not take place to the same extent as in the later ones, when the amount of the glomerular secretion has markedly diminished.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

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NEURITIS IN CEREBRAL TUMOUR.

THE cause of the neuritis in cerebral tumour is still to some extent uncertain, and there may be said to be, in the meantime, three theories held by various clinicians to account for its occurrence. These are—(1) The theory of Schmidt-Rimpler and Manz, that the presence of a cerebral tumour raises the intracranial tension and thus causes the cerebro-spinal fluid to be forced into the inter-sheath space of the optic nerve. (2) Leber and Deutschmann teach that the neuritis is due to the phlogogenic influence of the products secreted by the tumour and brought into contact with the nerve and its sheath by the cerebro-spinal fluid. (3) Parinaud's theory is that the development of an intracranial tumour leads to hypersecretion of cerebro-spinal fluid and its accumulation under pressure in the ventricles; this interferes seriously with the lymphatic circulation, and neuritis is caused by the œdema thus created. The subsequent atrophy is the result of the long-standing œdema, and is analogous to what occurs in the œdema of heart and kidney diseases. Sourdille agrees with this last theory in the main, but in a recent paper suggests that the actual mode of production is somewhat different; he points out that the chiasma is anatomically almost a portion of the wall of the third ventricle, and is closely incorporated with it. An œdema, therefore, of the wall of the ventricle, which is postulated in Parinaud's theory, would at once and directly act upon the chiasma, and so down the optic nerves to the discs. This would matter less were it not that the swollen nerve is compressed in the narrow gateway of the optic canal or foramen; he finds, too, that a small falciform process of dura mater, which continues this canal backwards, still further tends to compress the thickened nerve. In several cases which he has had the opportunity of examining post-mortem, appearances were found which led to these conclusions. Like most modern authorities, Sourdille recognises no essential difference between neuritis and choked disc. His paper, which is a very careful production, deserves to be well studied by all interested in the pathology of this condition.—*Arch. d'Opht.*, Paris, July and August, 1901.

EXTRAOCULAR COMPLICATIONS OF SYMPATHETIC OPHTHALMIA.

AMONG the excessively rare complications of an injury to an eye, so rare that few surgeons, even in large practice, have seen any cases, and that many regard the simultaneous occurrence of the two conditions as an example of an accidental rather than a causal relationship, is that of the manifestation of deafness along with, and at the same time as, sympathetic ophthalmia. In a paper describing a dreadful case of this sort, de Wecker objects to the expression used by Schirmer in his article on sympathetic ophthalmia in the "Graefe-Saemisch Handbuch": "In view of the extreme rarity of these complications (namely, morbid phenomena in other parts of the body), the author finds himself obliged to regard them as fortuitous coincidences." A case was recorded by Rogman in 1900, in which a man, apparently in quite good health, underwent extraction of cataract by the "combined" method. The operation was followed by irido-choroiditis, and, in four weeks, by sympathetic ophthalmia. By the end of three months the patient was not only completely blind, but absolutely deaf as well. De Wecker's own case was that of a man, æt. 47, whose left eye met with an injury, a flying chip of granite from a mason's chisel striking it and causing traumatic cataract and a wound of the iris. In this eye he never afterwards had more than bare perception of light, and that only in the extreme outer part of the field. Three weeks later he had an attack of malarial fever (he lived in the Seychelles Islands), severe pain in the right eye came on, and, in three days, it also was stone-blind. At the same time he suffered from excessive hyperæsthesia to sounds, and, within a couple of months from the date of his original accident, he became absolutely deaf also. In spite of energetic, even heroic, treatment, the nature of which this is not the place to discuss, no improvement in his condition was brought about, and the patient dragged out four years in this miserable state. The aurists consulted reported that the deafness was due to otitis interna. A somewhat similar case was reported some years ago by Snellen of Utrecht. The pathology of this train of misfortunes can hardly be other than a basal meningitis, a fact which lends support to the theory of transmission of sympathetic mischief by way of the optic nerves.—*Ann. d'ocul.*, Paris, October, 1901.

PROGRESSIVE MYOPIA.

IN a very interesting paper, Priestley Smith (Birmingham) discusses with much care several questions dealing with the progress of myopia, and publishes a chart, formed upon a plan not hitherto employed in this connection, which shows at a glance the downward progress (if any) of one hundred cases of myopia. He limited the cases to his private practice, because one can rely much more upon accuracy when dealing with them, but they were not otherwise selected in any way, provided the patient had been seen twice at an interval of not less than five years, that he had a myopia of at least 1 D, and that he was free from disease of the cornea, iris, or lens. As every one of the patients was myopic in each eye, the chart represents a total of two hundred eyes. Relying partly on the information gained from this methodical investigation, he is of opinion that the chief data on which we can ground any prognosis we may make in regard to the fate of a myope, must be the following:—(1) *The age of the patient.*—The younger the patient, the more likely is his myopia to increase. (2) *The degree of myopia.*—Other things being equal, the higher the myopia, the more likely is it to increase. Thus, high myopia in a child is of very evil augury: a child who has 10 D of myopia at 10 years of age is likely enough to have 20 D when he is 20. (3) *The condition of the choroid and retina.*—The higher the myopia, the lower is the average acuteness of vision. The higher degrees are to be feared less on account of the error of refraction in itself, than for the loss of vision due to choroidal and retinal changes. These are apt to be much worse in the adult than in the child: thus a child with 8 D of myopia is not so likely to have choroidal changes as an adult myopic to the same degree: the child will therefore probably enjoy much more accurate vision. (4) *The constitutional condition of the patient.*—If the patient is feeble and ill-nourished, myopia is all the more likely to increase in degree: thus, it is often seen to make much advance during prolonged lactation. It is interesting to note that, according to Schwabe, the complications of high myopia are twice as common in women as in men. (5) *Probably heredity.*—Heredity plays an important part in the development of myopia, and it is no doubt very frequently the case that hereditary myopia, even when of high degree, is free from the worst complications, but it is not safe to build too much upon this. (6) *The occupation of the patient.*—The effect of constant work of the eyes, especially upon objects held within a short distance from the eye, is very evident in clerks, dressmakers, and persons of similar occupation, and especially in those who refuse or neglect to lengthen their working distance by the aid of concave glasses. Mr. Priestley Smith concludes his article by giving the wise advice to suspect every myopia, and particularly every youthful myopia, of a tendency to increase, and to treat it accordingly.—*Ophth. Rev.*, London, December, 1901.

ADAPTATION OF ARTIFICIAL EYES.

In a certain proportion of the cases in which it has been found necessary to remove the eye, it is very difficult for the optician to make an artificial eye which will fit the socket and give a natural appearance, on account of cicatricial bands which have formed under the conjunctiva, either as the result of the direct effect of the injury destroying the eye, or of the inflammation of tissues prior to its removal. Domec of Dijon has found his work greatly assisted in some of those patients by making a cast of the orbit, which is first painted with cocaine. A mass of paraffin of approximately suitable size is warmed to near melting point, and when just about to set, and while still of the consistency of dough, this is packed into the orbit. It is left in from fifteen to thirty minutes, and, while still *in situ*, the proper position and size of the pupil to agree with the other eye are exactly marked upon it: there is no difficulty in its removal. Upon this as a basis the workman has no difficulty in adapting an eye, and in a number of cases in which the stock eyes had given much annoyance and irritation, Domec was able to manufacture in this way a prothesis which could be worn with perfect comfort.—*Clin. opht.*, Paris, November 25, 1901.

ACCIDENTS IN AERATED WATER FACTORIES.

AT the request of the Home Secretary, Snell (Sheffield) has drawn up a report upon the face-guards provided by manufacturers for the protection of their work-people from the bursting of bottles. This was very necessary, for the number of accidents which occur in this way, the number of eyes lost annually from this cause, is painfully high. He elicited the fact that in some of the works the employees could not be induced to wear the gauze-protectors supplied, under the idea that they caused the sight to fail, but on careful inquiry he could find no real foundation for this impression, provided the mesh of the screen was of suitable size. He reported, however, that goggles did not afford sufficient protection, for several persons had been injured about the neck (one indeed fatally) by flying chips or fragments of glass, and, besides, the goggles were too easily knocked aside by a piece of glass flying with high velocity. He therefore recommended shields covering the whole face and neck, the netting of which is sufficiently fine to allow no risk of any minute particle passing through. The reporter was informed, on inquiry as to the frequency of breakages, that about 1 per cent. of the bottles give way: one firm took notes for him of the breakages for one day, during which 1800 syphons and 400,000 bottles were filled; of the former, four burst, and of the latter, 740. Another firm, employing 2500 hands in winter and nearly double that number in summer, had 400 of their work-people injured, slightly or severely, in the course of one year, so that the importance of this matter, from an economic point of view, is not trifling.—*Report furnished to the Home Office.*

FRESH FACTS AND THEORIES

On the Origin of Monochorial Twins: an Argument from Armadillo to Man.[1]

That twins may arise from one ovum is certainly true of some invertebrate animals. It is of common occurrence, especially in warm weather, in one of the earth-worms, *Allolobophora trapezoides;* it can be readily induced in some sea-urchins (*e.g. Sphærechinus granularis*) by slightly warming the water in which the eggs are developing; it can be brought about, in not a few cases, from Cœlentera to the lancelet, by isolating the first two blastomeres; and so on. A very striking case has been reported by Marchal in regard to an insect, *Encyrtus fuscicollis*, one of the parasitic Hymenoptera, where a single ovum gives rise to "a legion of small morulæ," forming a chain of 50 to 100 embryos, enclosed in an "amniotic" envelope, which has lost its vesicular form and become a long flexible tube. Beside such an extraordinary instance the occurrence of monochorial human twins seems a small matter!

But as the origin of monochorial twins in man is still a vexed question, it may be of interest to sum up a recent re-discussion of the problem by A. Rosner. His communication is the more welcome since it is based on some definite observations. Concrete facts are much needed, where there are theories galore. Does the germinal area, developed after normal fertilisation, sometimes divide into two (Ahlfeld)? or may the entrance of two sperm-nuclei into an ovum induce a normal independent development from two centres (Fol)? May a binucleate ovum, fertilised by two spermatozoa, give rise to monochorial twins (Schultze)? or will the result be a double monster? Many similar questions have been asked.

On general embryological grounds, it seems fairly certain that each of the monochorial twins must arise from a distinct blastodermic vesicle. For each has an umbilical vesicle, and there is no evidence that an umbilical vesicle can be divided into two. Thus the question is narrowed to this, how may two blastodermic vesicles arise in contact and develop with one chorion around them both? May it be that the first two blastomeres, becoming slightly dislocated, develop in independence, each as it were an intact ovum, as is often observed as the result of certain tricks which the experimental embryologists are now accustomed to play on eggs? It is possible, but there is no evidence that it ever occurs in mammals. Or may it be that a binucleate ovum, having both its nuclei fertilised, may behave as if it were two ova in close contact? It is possible, but there is no evidence. Or may it be that the monochorial twins arise from two distinct ova, which have been brought into close companionship, and have developed within one chorionic investment formed from the early coalescence of the two chorions, perhaps as the result of deficient local nutrition. If two contiguous blastodermic vesicles are surrounded by a common caduca (decidua capsularis, reflexa), the chorionic areas which are in contact and form the partition between the two developing ova may disappear, simply because they are not in immediate touch with the nutritive caduca.

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[1] A. Rosner, "On the Origin of Monochorial Twin-Pregnancy," *Bull. Internat. Acad. Sci. Cracow*, No. 8, November 1901, pp. 443–450, 1 plate.

The last interpretation is the one which Rosner adopts, and the question is narrowed again to this, how may two ova come to be such close companions that they, or their blastodermic vesicles rather, are surrounded by a common uterine caduca? His answer is, that the companion ova sprang from a pluri-ovular Graafian follicle (the occurrence is well known), and were borne to the uterus united by the cells of the discus proligerus. This seems a fairly simple theory, but what is the evidence in its favour? The evidence is an argument from the armadillo to man.

It occurred to Rosner that some secure basis for interpretation might be obtained by a study of two well-known mammals, which *habitually* produce monochorial twins, or rather multiple fœtuses. These are two armadillos—*Praopus hybridus*,[1] studied by von Ihering, and *Dasypus novemcinctus*,[1] studied by Kölliker, Milne Edwards, Dugès, and von Ihering. The first has usually eight fœtuses, always of the same sex, and with a common chorion; the second has four within a common chorion, and also, according to von Ihering, of similar sex. Now, by sectioning the ovaries of *Dasypus*, Rosner found that many of the Graafian follicles are pluriovular. Out of fifty-two follicles, twenty-two contained more than one ovum; of these, eleven had two, seven had three, two had four, one had five, and one had seven. The two most developed contained four each, *i.e.* the number usually found within one chorion in the pregnant female.

As the primordial follicles in the ovary of *Dasypus*, whether fœtal or adult, contain only one ovum, the question naturally arises, how do the pluri-ovular follicles originate? Rosner's sections suggest the answer, that several follicles fuse within the ovary. The whole process may now be summed up,—several primordial follicles fuse, a pluri-ovular follicle results, each of the contained ova is normally fertilised, each develops with a chorion of its own; but within the investment of the caduca the chorionic partitions are dissolved till only one chorion is left surrounding all the fœtuses, in this case usually four in number. That the monochorial fœtuses should always be of the same sex is interpretable as due to the similarity of environing conditions, from the Graafian follicles onwards.

If the evidence from armadillo to man be admitted as cogent, we may venture to conclude that monochorial human twins start from a biovular Graafian follicle, whose two ova, normally fertilised, find lodgment within one caduca investment, and develop within one chorion, formed from the fusion of two. J. A. T.

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[1] We keep to Rosner's terminology.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society, *Wednesday, February* 5, 1902.—Prof. T. R. **Fraser**, President, in the chair.—Dr. **Wm. Stewart** showed a patient after compound dislocation of the ankle, with fracture of the neck of the astragalus and removal of the outer malleolus.—Dr. **Byrom Bramwell** showed a case of infantilism which he thought was due to arrested pancreatic secretion.—Mr. **Caird** showed—(1) A patient from whom 80 in. of gut were removed for tuberculous stricture and glandular implication; (2) a case of extensive rodent ulcer cured by Röntgen rays.—Dr. **Dawson Turner** showed one patient suffering from rodent ulcer, and another suffering from lupus, both treated by Röntgen rays and ultra-violet light. He also showed an apparatus for generating ultra-violet rays for the treatment of diseases of the skin.—Mr. **Purves** showed Henle's screen for protecting the area of operation in breast and neck cases from infection during operation.—Dr. **Logan Turner** showed—(1) Larynx and trachea from a case of diphtheria; (2) two specimens of malignant stricture at the upper end of the œsophagus.—Mr. **Purves**, for Prof. **Annandale**, showed—(1) Ruptured femoral artery and vein from a crush of the thigh; (2) portion of femur removed in second amputation in same case; (3) epithelioma of nape of neck, removed with cautery; (4) branched renal calculus; (5) vesical calculus showing moulding, consequent on its position between lateral lobe of prostate and bladder.—Drs. **Gibson** and **Stewart M'Donald** showed—(1) Spinal cord showing pseudo-tabes syphilitica (with microscopic demonstration); (2) hæmorrhage into the cusps of the pulmonary valve (with microscopic sections).—Dr. **Melville Dunlop** read a paper on a case of chloroma. The patient, a boy æt. 5, was admitted to hospital complaining of extreme weakness and swelling of the face. He was very anæmic and slightly deaf, and there were patches of ecchymosis on various parts of the surface of the body. These symptoms had been noticed for nearly a year previous to admission. Exophthalmos developed and slowly got worse, and there was marked œdema of the conjunctivæ. Swelling developed in the neck and temporal regions, and round the eyes. Latterly small greenish tumours appeared at the inner canthus of the eyes, and spread over the eyeballs. The anæmia became very profound, and the patient died of exhaustion. At the post-mortem there was found a greenish mass in the thorax, apparently growing from the periosteum of the sternum; similar masses were found in the heart muscle; the kidneys were infiltrated with the green patches mentioned before. The green colour was very intense at first, but quickly faded and was gone in a day. The green colour is probably due to highly refractile fat-like bodies, which are found scattered through the masses of tumour tissue. The tumours originate in the bones, and infiltrate nearly every organ in the body with the exception of the brain and nervous system, which are never invaded. The kidneys are especially affected. The tumours consist of large round cells embedded in an amorphous material in which the refractile granules are found. The disease occurs in patients under 15 as a rule, and mostly in boys; the anæmia, hæmorrhages, and the condition of the blood relate it to leukæmia. The patient rapidly got worse and died.—Dr. **Bramwell** read notes of two similar cases, which are published in the present number of the Journal.—Mr. **Cathcart** read a note on a method of securing the lingual artery in excision of the tongue through the mouth.—Dr. **Matheson Cullen** moved, "That the Society should petition the Town Council to continue the notification of measles." Dr. Cullen contended that measles had not been properly dealt with in the past: notification was only the first step, and should be followed by efficient isolation and disinfection. The schools where the children attended should also be notified, and thus a fruitful cause of the spread of infection would be removed. The only serious objection to the notification is that of the expense involved, and Dr. Cullen suggested a modified system of notification, whereby the first case in each family would be notified, and no other case from the same family till after thirty days had elapsed. This method is practised in Wigan and some other places with success. He felt sure there was enough public spirit in the profession in the city to enable the authorities to make sure that every case would be notified, though only the first is paid for. The motion was duly seconded by Dr. Webster and adopted by the meeting. A committee was appointed to draw up the petition for presentation to the Town Council.

Edinburgh Obstetrical Society.—*Wednesday, February* 12.—Dr. **James Ritchie**, President, in the chair.—**Specimens.**—Dr. **Berry Hart** showed—(*a*) A large fibroid, removed by supravaginal hysterectomy; (*b*) specimen of transverse rupture of the fundus uteri in a full-time pregnancy.—Dr. **Haultain** showed—(*a*) Fibroid uterus with carcinoma of body, removed by abdominal route; (*b*) uterus with adeno-carcinoma of body, removed by vaginal route; (*c*) ectopic gestation sacs at third and fourth month respectively, removed from the same patient at different times within a year; (*d*) uterus with large calcified fibro-myoma; (*e*) microscopic slide from case of primary tuberculosis of cervix.—Dr. J. W. **Ballantyne** showed—(*a*) Cephalometer for antenatal mensuration; (*b*) fœtus with exomphalos and adhesion of hand and chest wall.—Dr. **Haig Ferguson** showed a uterine fibroid removed by supravaginal hysterectomy.

Dr. R. C. **Buist**, Dundee, read a paper on "Symphyseotomy in Practice." He narrated four cases. In the first, the diagonal conjugate was 9 cms. There had been three labours with loss of child. After symphyseotomy by Frank's method, the fourth was born alive. The fifth pregnancy ended in large twins. The second patient was rachitic; the diagonal conjugate was 10 cms. The first and third deliveries were by symphyseotomy, the second was spontaneous. In the third case the diagonal conjugate was 8 cms. The first and second labours occurred at the seventh month. The third was after symphyseotomy, forceps having failed. In the fourth case the diagonal conjugate was 8·5 cms. The first three children were delivered with much difficulty and badly dinted; the fourth was delivered after symphyseotomy. Ayre's subcutaneous method was adopted in the last four operations. In conclusion, Dr. Buist made observations on the operation and the after-treatment.—Dr. FORDYCE read Professor FEHLING'S paper on "Remarks on Diagnostic Help in Gynæcology."

GLASGOW MEDICO-CHIRURGICAL SOCIETY, *February* 7, 1902.—Dr. J. WYLIE NICOL showed a case of frost-bite of the fingers.—Dr. T. K. DALZIEL showed—(*a*) A case in which there was perforation of a pyloric ulcer. The patient, a lad of 17, had suffered slightly from dyspepsia for two years before the operation. On the night of December 19, 1901, he took ill, with symptoms of peritonitis: the point of greatest tenderness was over the appendix. On the following morning an incision was made over the appendix area, but the appendix was found normal. Another incision was then made in the middle line, disclosing the presence of lymph and food in the peritoneal cavity. The food was found to issue from an ulcer in the pylorus. The ulcer was excised in the long axis of the pylorus and the wound sutured in the transverse axis. The patient is now well. (*b*) A case of hæmorrhage from a gastric ulcer, in which excision of the bleeding ulcer was performed successfully. The patient, a female, æt. 32, had a history of dyspepsia for three years previous to the operation. Between January 13 and 15, she vomited large quantities of blood on several occasions, and on the latter date was seized with convulsions. An incision was made in the anterior wall of the stomach, and an ulcer, still bleeding slightly, was found on the lesser curvature. The mucous membrane and muscular coat of the stomach round the ulcer were clipped away, but the peritoneum was left intact. Eight days after operation the patient was seized with thrombosis in the right lung, and later, in both femoral veins. A complete recovery took place. (*c*) A case in which there was gangrene of the gall bladder. The patient, a female, æt. 22, was admitted to hospital on August 12, 1901, with symptoms of peritonitis. There was marked fulness in the epigastrium, and the point of greatest tenderness was under the right costal margin about 1 in. from the middle line. On opening the abdomen, the gall bladder was found to be gangrenous. After packing round the gall bladder, it was incised, and a number of gall stones rolled out. A good recovery took place. Before this seizure there had been no complaint of pain over the gall bladder.—Dr. LAWRIE showed two cases in which acute traumatic gangrene was associated with simple fracture, and in which amputation resulted in recovery.—Dr. W. F. GIBB showed a patient operated upon for Jacksonian epilepsy. The patient, a man, æt. 20, fell, striking his head on a cask. He was stunned at the time, but was able to do some work the same evening. Next morning he had convulsions, and continued to have them with increasing frequency till the date of operation. There was no evidence of fracture of the skull. A disc of bone was removed from the right parietal region, but nothing to indicate injury to the brain was seen unless slight œdema of the membranes. The disc of bone was not replaced. The patient is now quite well.—Dr. T. **Beath Henderson** read notes of a case of morphinism.

Glasgow Pathological and Clinical Society, *February* 10, 1902.—Mr. H. E. **Clarke**, President, in the chair.—Dr. **Beatson** demonstrated a series of specimens connected with appendicitis, and discussed the question of the expectant treatment of the condition as against immediate operation. A very interesting paper and debate resulted. Dr. Beatson believes in expectant treatment in nearly all cases of appendicitis. In support of his thesis, Dr. Beatson brought forward all the cases of appendicitis with which he had been concerned since 1896, the year in which he first operated on the appendix. There were forty-six cases, all of which were treated expectantly, with happy result in all except one. None were operated on in the acute stage, but twenty-eight were operated on later, on account of recurrence or other unfavourable circumstance. In Dr. Beatson's experience, the bugbear of the practitioner, rupture of abscess or perforation leading to general peritonitis, was quite exceptional. Only one case, the fatal one, was of the acute type, with virulent microbic infection and general peritonitis, which demand immediate operation. This type Dr. Beatson considers much rarer than the stress which has been laid on it by writers leads one to suppose. In his cases suppuration was not common, and when abscess resulted it was nearly always retrocæcal and extraperitoneal. The microbic infection was generally of no great virulence, and even when it infected the peritoneum, it was usually rapidly shut off by adhesions, and was then safer let alone until the acute symptoms had subsided. Dr. Beatson's cases showed a remarkable absence of concretions. Constrictions, bands, and adhesions due to former inflammatory disturbance were the conditions found in the cases operated on, and the type of inflammation resulting was not very virulent, and the tendency to general peritonitis nil. In the discussion which followed, Dr. Beatson's paper was attacked on many points of detail; there was a tendency to avoid the main question of treatment, beyond entering an intimation of dissent, but the pathology was fairly considered, and debated by Mr. Maylard, Professor Muir, Dr. Workman, Dr. Rutherford, Dr. A. A. Young, and Mr. Clarke.—Dr. W. L. **Reid** described the clinical features of a case of unusual uterine tumour (chondro-sarcoma), and Dr. **James Walker** demonstrated the tumour with microscopical preparations.—Dr. **John M. Cowan** demonstrated specimens of hearts, illustrating anomalous and diseased conditions of the coronary arteries. The most interesting was a case in which it appeared that obliteration of one of the main branches was compensated for successfully by enlargement of the neighbouring branches.

OBITUARY.

Robert Peel Ritchie, M.D. (Edin.), F.R.C.P.Ed., F.R.S.E.

By the death of Dr. Robert Peel Ritchie, the medical profession in Edinburgh has lost a much-esteemed member, and the city a useful citizen. Born in 1835 in Edinburgh, where his father was a civil engineer and for some time a magistrate of the city, he was educated at the Academy. Choosing medicine as his profession, he studied at the University, and graduated M.D. in 1856. Just before graduating he was for some time Assistant House-Surgeon at the Perth Infirmary, when Sir John Sibbald was House-Surgeon. After taking his degree he acted as Resident Physician to the Bethnell House Asylum.

Resolving to practise his profession in his native city, he was elected a Fellow of the Royal College of Physicians in 1863. He joined the staff of the Old Town Dispensary, and acted as one of the obstetrical physicians, under the late Dr. Matthews Duncan. In this institution he took a life-long interest, and was at the time of his death, as he had been for many years, on the board of management. Elected one of the Physicians of the Royal Hospital for Sick Children, he threw himself heartily into the work, and lectured on diseases of children. Having served his full time, he was placed on the Consulting Staff. Various charitable and philanthropic organisations received his attentive care, and he was Honorary Physician for the Rescue Home, St. John's Hill, and also for the Night Asylum for Vagrants.

He became a Fellow of the Royal Society of Edinburgh, and was a member of its club. He was one of the founders of the Microscopical Society, was formerly a President, and at the time of his death was one of the Vice-Presidents. As President of the Harveian Society, he delivered an address on the founders of the Edinburgh Medical School. After much research and painstaking labour, this address was expanded into a handsome volume, entitled "The Early Days of the Royall Colledge of Phisitians of Edinburgh." This book was most favourably received by the public and the profession, as it gave a careful and interesting account of the beginnings of the College, and the negotiations for getting a Royal Charter, as well as biographical notices of some of the early fathers of the College.

Dr. Peel Ritchie was a member of that most select of Edinburgh medical societies—the Æsculapian—and at its festive board showed the sociable and cheery side of his character.

He acted for nearly five years as Treasurer of the Royal College of

Physicians, and was an ideal treasurer, displaying great business capacity and power of organisation. He demitted office in 1887 to become President of the College, the duties of which he discharged with much acceptance to the Fellows. He served for five years as one of the College Representatives on the Board of Management of the Royal Infirmary.

A member of the Church of Scotland, he served in succession as an elder in the Tron and St. Cuthbert's parishes. He took a keen interest in all church work; and, being a Conservative in politics, he was Chairman of the St. Cuthbert's Church Defence Committee. He also discharged the duties of Chairman of the Medical Committee of the Church of Scotland's Deaconess Hospital.

As a member of the old Parochial Board, the claims of the poor engaged his attention, and the experience thus gained led to his being elected to the second Parish Council formed in Edinburgh, of which he was one of the most active members. The Public Health side of the tuberculosis controversy received his especial care, and he represented the Parish Council in the recent Congress on Tuberculosis in London.

Amidst all these public duties he had a considerable practice, and was much appreciated by his patients as a physician and for his sterling worth. For many years he was an Examiner for the Royal College of Physicians, first on Midwifery, and latterly on Medical Jurisprudence and Public Health.

The loss of his wife some years ago told greatly upon him. He suffered from rheumatic arthritis, which made locomotion difficult; but he was always pleasant and bright. A shock of apoplexy and a short illness brought his life to a close.

He is survived by two sons, one a lieutenant in the Royal Navy, the other a member of his own profession.

His funeral was largely attended by his professional brethren and the members of the various organisations to which he belonged, testifying to the esteem he enjoyed as a physician and as a citizen.

Dr. Peel Ritchie was a most thorough and painstaking man. Whatever his hand found to do he did it with all his might. Holding strong convictions, he had the courage to declare them; but if the vote went against him, he bore no grudge. A man of unostentatious piety, he was courteous to all, and, having done his day's work faithfully and well, he has entered into his rest.

ANALYTICAL REPORTS.

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Maltine; Maltine with Cod-Liver Oil; with Cascara Sagrada; Malto-Yerbine; Liquid Peptonoids; and Carnrick's Beef Peptonoids.

(The Maltine Manufacturing Company, London.)

It is not an easy matter to find new things to say about such well-known products and preparations as those detailed above. The properties and actions of malt extracts in general, in relation to the conversion of amyloses into dextrines, and in some part sucroses, are by this time common knowledge; their richness in carbohydrates, as well as in amylolytic ferments, is equally recognised, and deservedly held to confer upon them a highly nutritive value. Maltine, it need scarcely be stated, fulfils both these functions. Practical use of the same gives actual proof of these facts; the more especially in young children, requiring some readily assimilable addition to their ordinary food, when unable to extract from the latter the physiological coefficient for health and strength, and who almost always take kindly to it.

The combination of maltine and cod-liver oil is especially valuable as a satisfactory means of administering the oil to those children who will not take cod-liver oil alone, thus deriving double benefit from the compound. The Maltine Company's preparation of these two bodies is above criticism.

Another combination supplied by the same company contains maltine and yerbine; in it the malt extract is modified by the addition of the active principles of the yerba santa, acting after the manner of a stimulating expectorant, in the proportion of 30 grs. to each ounce. In maltine with cascara sagrada each ounce contains the extract of 60 grs. of the latter.

The liquid peptonoids and the beef peptonoids in powder, associated with the name of Carnrick, are also well-tried friends, which in many instances prove to be of more value, and more easily tolerated, than some of the later more specialised proteose forms. These peptonoids are derived from the native proteids of beef and milk, artificially resolved in part into simpler types, mixed with similarly treated gluten. The liquid peptonoids contain the minimum amount of pure alcohol sufficing to preserve them unaltered.

Both preparations afford one excellent and valuable aid in cases where speedy absorption of nourishment is imperative; acting also not only as food but also as a restorative and general stimulant, on occasion.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING JANUARY 25, 1902; AND FOR THE YEAR FROM DECEMBER 29, 1901.

	Temperature.			Rainfall in Inches.		Sunshine. Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Dec. 29.	Actual.	Accumulated from Dec. 29.	
		Above 42°	Below 42°.					
Mean .	36°·9	30°	168°	2·6	...	37	...	3°·41
Observed	39°·9	39°	111°	1·9	...	30	...	3°·72
Difference	+3°·0	+9°	−57°	−0·7	...	−7	...	+0°·31

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING JANUARY 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	1334	222·1	226	37·7	128	21·4	312	52·0	146	24·3
Actual Deaths and Rate per 10,000	1190	198·0	226	37·7	149	24·7	250	41·6	121	20·2
Difference from Mean	−144	−24·1	±0	±0	+21	+3·3	−62	−10·4	−25	−4·1

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	82	13·6	29	4·9	114	18·9	110	18·4	54	9·0
Actual Deaths and Rate per 10,000	76	12·6	33	5·5	125	20·8	95	15·8	61	10·1
Difference from Mean	−6	−1·0	+4	+0·6	+11	+1·9	−15	−2·6	+7	+1·1

The four weeks ending January 25, 1902, were much warmer than usual, more because of lack of cold than from excess of warmth; dry, the rainfall being 27 per cent. below the mean; dull, with a greater daily variability of temperature than usual. These phenomena were associated with unusual prevalence of dry west winds, blowing with a much greater force than is commonly met with during the period; in fact exceeding the mean by perhaps, roughly, 30 per cent.

The population of the four cities in the East of Scotland discussed here as estimated to the middle of 1902 is—

Edinburgh,	322,966
Dundee,	162,078
Aberdeen,	157,505
Leith,	78,605
Total,	721,154

an increase of 9964, or 1·4 per cent., over 1901. The report for January 1902 introduces a new classification of the causes of death, based upon the recently-issued "Nomenclature of Diseases." Many of the classes are radically altered, numbers of diseases entered under classes differing from those containing them before.

The figures, to represent the numbers of deaths classified in the same manner as hitherto adopted in this record, consequently require to be extracted from scattered data and added together, to obtain their comparable values. As one of the chief aims of the section consists in illustrating the variations in values between the past and the present, for the preceding month and the year up to date, the new classification cannot be made use of for some years; for at present no data exist from which to formulate average means. Until figures under this arrangement are obtainable, at least for five years, there can be no proper determination of averages.

The grouping of the separate causes under the headings employed for many years past, if taken from the altered tables, enables exactly analogous details to be prepared, and the series of values to be continued unchanged.

From the figures thus obtained the general death-rate for January is shown to be far below the average, more than 10 per cent.—largely due to deficits from respiratory causes, 19 per cent.; nervous causes, 17 per cent.; and from phthisis; deaths from circulatory, urinary, pneumonic, and cancerous diseases are over the average. Influenza caused twenty deaths.

Thus January, warm, dry, but dull, with great diurnal variations, presents a low death-rate, especially from diseases of the respiratory system. Deducting deaths from pneumonia from the total respiratory deaths, the deficit in the remaining respiratory cases falls 36 per cent. below the mean.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

First Annual Meeting of the Carnegie Trust.

The attention of the Executive Committee has been almost entirely devoted to carrying out Mr. Carnegie's wishes with regard to the payment of University and Extra-mural fees to all qualified applicants. On analysing the report, we find that forms of application were issued, by request, to 6000 applicants. Of these, 3600 were returned with the necessary information duly filled in. Of this number 937 were disqualified, mainly on account of insufficiency of preliminary examination; 2663 applications were approved of, but 222 of these at a later date were withdrawn, for reasons which we need not detail here. There thus remained 2441 students of the four Scottish Universities who received payment of class fees for the winter session, 1901–2. This represented a sum of £21,941, 16s. 6d. If the four Universities be analysed, we find that, in St. Andrews, 268 students made use of the benefaction, representing a sum of £2452, 6s.: in Glasgow, 828 students, at £7672, 13s.; in Aberdeen, 473 students, at £3806, 1s.; and in Edinburgh, 872 students, at a total sum of £9010, 5s.

The Executive Committee, in accordance with the expressed desire of Mr. Carnegie, asked no questions regarding the circumstances of the applicants; but we have reason to believe that more than one applicant availed himself of the Trust money, although his financial position hardly warranted his doing so.

The Claims of the Scottish Universities in general upon the Carnegie Trust.

The claims of the four Scottish Universities upon the Carnegie Trust have now been issued to a wondering public. Let it be remembered that there is an annual sum of £50,000 to be distributed not only between these four Universities, but, as expressly stated in the original trust-deed, between the Extra-mural Schools as well. The four Universities, between them, hope to establish claims to more (£51,300) than the whole of the annual sum available, leaving rather less than nothing for the unhappy Extra-mural Schools, and others who are undoubtedly intended, by the terms of the original trust-deed, to the benefits of participation.

Nor is this all. Not only do the Scottish Universities leave absolutely nothing to those who are to benefit equally with them, but they actually demand another capital sum of some £135,000 !!

That is to say, if these claims are to be carried out, the capital claims of Edinburgh and Glasgow alone will absorb the whole of the total sum available for nearly three years. After which the ordinary annual payments may possibly be allowed to commence. But, even then, the total sum available will not suffice to meet the demands of the Universities; and any other bodies mentioned in the original trust-deed as being entitled "to participate on application," can, in the words of the immortal bard, "go hang."

It is most sincerely to be hoped that the Trust will not accede to these demands. That the Trust will do its duty goes without saying, so the Extra-mural Schools need have no fear that they will be abandoned by those whose duty it is to carry out the terms of the Deed of Gift. These terms are very definite, and leave no loophole for escape. They are as follows:—

"Extra-mural colleges, schools, or classes in Scotland, attendance at which is recognised as qualifying or assisting to qualify for graduation, are, on application, to be entitled to participate under clause A, to such an extent as the committee may from time to time determine, and the students thereof are to be admitted to the privileges of clause B."

As the committee have already carried out their duties to the Extra-mural Schools under clause B, there can be no room for doubt that they will do their duty under clause A.

The Proposed Treatment of Incipient and Transitory Mental Disorders in the Royal Infirmary.

AT a special meeting of the Medico-Chirurgical Society, a number of distinguished alienists and others succeeded in making out a strong case for the necessity of providing accommodation for the treatment of incipient and transitory insanity, apart from that available in ordinary asylums. While heartily in sympathy with the proposal, we think it to be our duty to point out certain difficulties connected with its adoption, and especially with regard to providing the desired accommodation within the precincts of the present Royal Infirmary. The first difficulty is to be found in the status of the patients under consideration as regards certification. If they are not to be certified, then it is only right that the managers of the Infirmary, and the general public living in the neighbourhood, should realise that the adoption of the proposal will mean that fifty or sixty persons who are virtually insane, even if the insanity be only incipient or transitory and recent, will be living within the Infirmary or neighbourhood, and that there will be no legal power of detention over such individuals, so that they may leave the institution whenever they like, or escape without fear of arrest.

Our experience is, that persons with incipient insanity are just those who are most difficult to persuade that they require treatment, and who resent its enforcement; while, on the other hand, for curative purposes, they stand most in need of strict discipline and a certain amount of restraint.

The clinical teaching of insanity is said to suffer from the inaccessibility of Morningside and Larbert Asylums, so that students can only avail themselves of it to a limited extent. We do not understand this argument as regards Morningside, and it seems to us that the same defects will still continue to exist, even if the proposed Infirmary wards are established, since it would be ludicrous to confine the clinical teaching of insanity to a class of cases which are merely incipient and transitory, and neglect those which form an equally, if not more important class, namely, persons who are legally certified as lunatics.

The suggestion as to the out-patient department can only be recommended so far as expert advice is concerned, certainly not for purposes of treatment, inasmuch as the first essential in mental therapeutics is to remove the patient from the worries and discomforts of business and domestic life, to place him on a liberal and suitable diet, with careful and attentive nursing. How is the Infirmary patient to obtain these by attendance at an out-patient department?

It was pointed out by Dr. Affleck that the present site of the Infirmary does not afford room for the establishment of the proposed psychiatric wards. The living space laid down in the original plan of the Infirmary has already been seriously encroached upon, and we trust the managers will never countenance any scheme which will in any way impair the welfare and health of those for whom accommodation is already provided.

The "Cultured" Physician.

SOME would have us believe that the cultured physician is running as great a risk of becoming extinct as the dodo. The correctness of this assumption seems to depend on what is meant by "culture." Dictionaries are not of much assistance, and even the redoubtable Mr. Murray fails us at a pinch. We once heard a bacteriological laboratory described as the "home of pure culture," but that does not in any way help us. What we have ascertained, however, is that most of those who lament the disappearance of culture in the medical profession are those who insist on the absolute importance of a classical training as the only basis of a sound education. Although no one would deny the advantage to some minds of a study of the classics, is it really suggested that culture, in the generally accepted sense, can only be attained in this way and in this way alone? The "cult" of the classics is a survival from mediæval times, the insistence upon which in these days seems out of place.

There are signs of a reaction against this state of things in the near future, even in centres where this aspect of education has hitherto been considered safe, to wit, Oxford. If this movement meets with success, it will practically revolutionise the teaching in the public schools. With the disappearance of the compulsory clauses, so far as they affect "classics," the teacher will be able to direct the studies of his pupil in those directions which appear best adapted to develop his intellectual faculties and towards which his tastes do most incline; whilst the position of the "Humanities" will be improved, since they will gain by attracting to their schools a class of willing scholars, in place of those who now attend by coercion. Will "culture" suffer? We think not; fortunately culture rests on a far broader basis! Your classical don is as much a specialist as his brother of the ward or laboratory. The difference between the two depends on the facility with which the classical man can introduce his specialty into general conversation, whilst a doctor or a scientist who refers to his own subject is at once accused of talking "shop." The mere ability to quote a tag from Horace or construe a passage of Terence is no evidence of culture, in the wide sense of the word.

The various channels through which culture may be acquired are so many and so far-reaching, that we can regard with equanimity any scheme which involves the disappearance of the compulsory clauses relating to the study of Greek in the curriculum of our Universities. There are other subjects of equal educational importance, and these, we hope, may be put on terms of equality as regards option of selection and examination, and also with those studies hitherto insisted on, without detriment to education in general or the medical profession in particular.

The Midwives Bill.

SCOTLAND has never been deeply agitated by the midwife question. It has been said that her population is so intelligent that it contains no "conscientious objectors." To the same reason she doubtless owes her freedom from "anti-midwives." In Scotland every one knows the difference between an educated man and an illiterate woman; every member of the medical profession is respected, so to speak, on account of his cloth. But in certain populous parts of England there is no aristocracy of intellect. The inhabitants of these districts go to the doctor, not for the use of his brains, but for bottles of medicine;

and, in providing those manual attentions which parturient women require, the daughters of Lucina successfully rival the disciples of Æsculapius. Herein lies the true inwardness of the midwife question. The "anti-midwife" is a person who cannot contemplate with serenity that form of ignorance which prefers the attentions of an uneducated woman to those of a qualified medical practitioner.

But until medicine ceases to be a profession and becomes a trade, with a nicely organised trade's union, such persons will continue to be few in number, loud in voice though they may be.

What, then, is the position of the ordinary man who has a large working-class element in his practice? Let no one imagine that for him money seriously affects the question. He attends working-class midwifery, not because he receives fifteen shillings or a guinea for a night out of bed and several visits, but simply to keep his practice together. If he could retain his medicine and surgery without doing obstetric work, he would willingly give up the latter and the money it adds to his income. He knows that, while poor people continue to live next door to one another, so long will one woman help another in child-bed, either for love or for a little money; and he has no objection whatever to the training of women, so that they may suitably earn a living by work of this kind.

At the same time, almost every member of the profession is strongly opposed to the Bill for the Registration of Midwives which is at present before Parliament. The reasons for this opposition have been long set forth *ad nauseam* in the journals. One aspect of the case will bear repetition. It is not generally known that the superior midwife of the present day does not nurse her patients herself, but simply attends their confinements, paying visits thereafter like a "doctor," and leaving a "pupil" or a "neighbour" to do the work necessary during the puerperium. No woman can make more than a bare pittance out of the fees now paid to midwives, unless she undertakes more patients than she can nurse herself. The present Bill will not in any way affect the untrained woman; but if it becomes law, the registered midwife will see to it that she makes a better income than her non-registered sister. The Bill will thus favour no one except women of the class above mentioned, who take numerous cases and leave the nursing in hopelessly incompetent hands. Needless to say that the working man's wife will not greatly benefit by the multiplication of "lady doctors" who have spent three months on their medical education, and this is the only result which the present Bill can possibly bring about. If our legislators can do no better than this they had better leave it alone, or a Bill for the suppression of unqualified midwives' assistants will soon become necessary.

British Medical Association Branch Meeting.

A MEETING of the Edinburgh, Perthshire, Stirling, Kinross, Clackmannan, and Dundee Branches was held in Edinburgh on the 21st February, under the presidency of Dr. Argyll Robertson. Dr. Templeman of Dundee and Dr. Stirling of Perth officiated as vice-presidents. The meeting was eminently successful, a result which was largely due to the excellent arrangements of the secretaries, Mr. James Hodsdon and Dr. Norman Walker. The museum and clinical meeting were located in the Royal Infirmary, a large number of interesting specimens and cases being exhibited. The members of the associated branches thereafter dined together in the Royal British Hotel, Dr. Argyll Robertson taking the chair, and Drs. Russell and Gibson acting as croupiers. The company, which numbered over fifty, was thoroughly representative of town and country, and a very enjoyable evening was spent.

The Examination of Persons under Arrest.

THE illegality, in cases of suspected criminal abortion and infanticide, of making a *per vaginam* examination, without having first obtained the free consent of the woman, after the objects of the examination have been clearly explained to her, is, or ought to be, well known to every medical man. There is no authority, however high, which can empower such an examination against the will of the person concerned. This rule is based upon the principle that no person is bound to afford evidence against himself or which may lead to his incrimination. The application of the principle to the examination of male prisoners does not, however, appear to be so well known, nor does the rule seem to be generally conformed to in practice. Naturally, the same principle is involved in the examination of a man as in that of a woman; and the practice of requesting men, suspected of criminal assaults upon women, to submit to an examination of their genital organs, without first of all warning them of the object in view and obtaining their consent, is both reprehensible and illegal.

At the Central Criminal Court of London a few weeks ago, the Recorder drew attention to the still wider application of the principle involved, when he severely animadverted upon the conduct of the police in compelling a man, arrested on suspicion of fraud, to strip himself, in order that his distinctive marks might be noted. Such marks may have been wanted in order to connect the prisoner with the crime in question, or, on the other hand, with the object merely of facilitating his subsequent identification, but the case is of interest to medical men, inasmuch as it clearly indicates the necessity for following the recognised rule of procedure in all examinations of prisoners.

Alcohol and Insanity. In his last annual report to the Managers of the Royal Edinburgh Asylum, Dr. Clouston informs us that 25 per cent. of the admissions to the asylum during the past year were directly due to alcohol. It is well, however, to bear in mind that the ordinary clinical forms of insanity are commonly attributed to scores of different causes, including alcohol, and that there is, undoubtedly, some justification for the growing scepticism regarding exciting causes of insanity. We have all known persons who have drunk deeply throughout their lives, and have continued to retain what usually goes by the name of sanity. Therefore, alcohol does not by itself produce insanity. Assuming, for the sake of argument, that alcohol is a direct exciting cause of ordinary insanity, in a given proportion of cases, we must at the same time assume an hereditary predisposition to insanity in these cases. We cannot numerically estimate an hereditary tendency, but, generally speaking, a so-called exciting cause diminishes in importance in the inverse ratio to the strength of such heredity. It is, moreover, probable that a person who indulges in drink to the extent of causing insanity must either have been insane before the event, or he must have been born with a craving for alcohol. We have, therefore, to weigh in each case, not only the influence of the so-called exciting cause against the gravity of the morbid predisposition, but we have also to decide whether the exciting cause itself is not the result of a neurosis. Enough has been said to show that the question is not a simple one. Alcohol does not cause insanity, as bullets on a battlefield, more or less by hazard, cause wounds or death; it is a selective agent affecting the already morbid, and more particularly those who have a hereditary tendency to indulge in it.

German Amenities. It has been fondly hoped that the *Engländerhetze* was almost entirely confined to the uneducated masses of Germany. Facts are, however, rapidly accumulating which prove that it is far otherwise. The bitter animosity shown towards this country during the last two years is indeed manifested as keenly by the conduct of the cultured as by the passions of the mob. Two communications are before us on this subject. One is from a German gentleman in Heidelberg, who had been asked to recommend a family to which a young Scotsman might be confided. His reply consisted in the strongest advice, not to send any one from this country to Heidelberg at present; it contained the sorrowful admission that our countrymen in that centre of enlightenment are not only jeered at in the streets, and insulted on every occasion in public places of resort, but are treated as pariahs by the leaders of society—if such a term can be applied to the university circles of that town. The other was furnished by an Edinburgh graduate, who has been studying in Berlin. This gentleman has been treated with boorish incivility by the hospital staff of the great Charité Hospital—in fact, the conduct of these worthies would require the pen of a Dickens to describe. It may be that the Germans are anxious to supply internal evidence of their descent from those Vandals who inhabited their country at the dawn of history. It has been commonly believed that the race became extinguished—partly in the oriental wars of imperial but tottering Rome, partly in struggles amongst the Moors of Northern Africa. Gibbon nevertheless contended that traces of these barbarians remained amongst the German inhabitants. Perhaps Gibbon after all was right.

A New Medical Baronet.

THE King has been pleased to confer a baronetcy upon Sir Thomas Barlow, K.C.V.O., Physician to His Majesty's Household. It would be difficult to single out any member of our profession who so thoroughly deserves such an honour, or one who has done more to raise and uphold the prestige of British medicine.

Victoria University.

AT the February meeting of Convocation of Victoria University, held at Owens College, Manchester, a motion was proposed in favour of establishing separate universities in Leeds, Manchester, and Liverpool. After some discussion the motion was defeated, and a resolution was passed disapproving of any policy involving the disruption of Victoria University as being detrimental to the best interests of higher education.

ORIGINAL COMMUNICATIONS.

LATENT PNEUMONIA.

By Harvey Littlejohn, M.A., B.Sc., M.B., F.R.C.S.Ed.,
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The tendency of disease to progress within the body in a latent manner, *i.e.* without giving rise to the signs and symptoms by which its presence is usually made manifest, is well known to every physician.

It is indeed characteristic of many diseases, that their onset is insidious, and that they have usually made considerable progress before the person affected is aware of their existence and the physician is able to make a diagnosis of the condition. Amongst the diseases which most commonly exhibit this characteristic of latency, are chronic or slowly advancing diseases of organs which are tolerant of considerable alteration in structure, without the continuance of their physiological action being materially affected. Examples of such conditions are seen in atheroma of the aorta and valves of the heart, in changes of the heart muscle, such as fatty and fibroid degeneration, parenchymatous degeneration of the liver and kidneys, and in the growth of cancer in various situations. But, apart from diseases of a chronic and insidious nature, it is well known that many acute affections may exist for a time without exhibiting their presence by the usual symptoms of illness, or even, when suspected to exist, without enabling the most skilled physician to accurately and unequivocally determine their true character.

Examples of this latter class are frequently afforded by the acute infectious diseases, such as measles, scarlet fever, diphtheria, and typhoid fever, while in pneumonia, pericarditis, peritonitis, and inflammation of other serous surfaces, not only may the symptoms of disease be masked or absent, but the person affected may continue to go about in a state of apparent good health. Cases in which a disease, whether chronic or acute, remains latent or concealed only in its preliminary stages, possess much less interest and importance than those in which the morbid process remains latent during its whole course, and the existence of which is only discovered after death.

Instances of such conditions are especially remarkable, when an acute or chronic disease is found to have extensively implicated organs of primary importance to the carrying on of the most necessary bodily functions.

It is difficult to explain and bring into accordance with generally accepted views how such affections as tumour of the brain, abscess in the same organ, large aneurysms in the thoracic cavity, or such acute processes as purulent meningitis, peritonitis, and pericarditis, pleurisy, or a pneumonia involving large portions of one or even both lungs, can run a latent course, betraying no sign of their existence until sudden collapse and death occurs.

Cases of this description are of great interest to every physician, but they are more especially so to the student of forensic medicine. The majority of medico-legal investigations relate to cases of sudden or violent death, connected with which there are often suspicious circumstances tending to incriminate another party. In no inconsiderable number of these cases the post-mortem examination enables us to determine that death was due to natural causes, by finding the presence of a *chronic* disease unsuspected during life, and which did not interfere with the ordinary occupation and habits of life of the deceased person.

It is well known that the commonest cause of sudden death is heart disease, especially aortic valvular disease, and that the same result may ensue from a variety of other diseases; while it is also recognised that these conditions may reach advanced stages without recognition and without causing the usual symptoms, until, for reasons we are unable to explain, they suddenly end in death.

In forming an opinion as to the cause of death in cases of this description, no difficulty will, as a rule, be experienced. The absence of injuries sufficient to account for death, the circumstances in which the person died, or was found dead, together with the discovery of pathological conditions in the body, known to be frequently associated with fatal syncope, will entitle us to attribute the death to natural causes.

An element of difficulty may, however, arise when the person has been the subject of ill treatment, and dies either suddenly or some time afterwards. Then the question, how far death was due to the ill treatment, or, on the other hand, was due to the existing disease, may give rise to considerable doubt. Under these circumstances the decision must rest upon the circumstances in each case, the nature of the injuries, and the stage to which the disease has advanced, together with any evidence available of its having influenced the previous health of the deceased.

The difficulties of the medico-legal examiner are greatly increased, should an injured party die and be found to have suffered from an acute inflammatory process, such as meningitis or peritonitis. Under these circumstances the additional question will have to be determined, namely, whether the diseased condition did not directly arise from the alleged violence. The fact that a person may be going about apparently in his usual state of health, and yet be suffering from an acute disease, which usually renders the sufferer incapable of exertion, must here be kept in view; while a point of great importance will be the position and nature of the injuries in relation to the site of the inflammatory condition. Medical literature contains many records of cases illustrating the medico-legal relations of latent disease, but the best monograph on the subject, so far as I am aware, is to be found in an article written by Christison.[1]

In this article he refers to pneumonia, and to the fact, already pointed out by Laennec, that the disease may advance till it completely obstructs a whole lung, without any sign of oppression of the functions of the lungs. He goes on to state that death in such cases may occur suddenly without any fresh cause appearing to act, or it may be occasioned by some other disease or agent of a different kind, such as violence.

Of all acute inflammatory diseases which may run a latent course during the whole period of their existence, pneumonia is the most common in my experience. Although cases of latent pneumonia are frequently recorded in the weekly journals, yet many of these can scarcely be counted true instances, since in some the disease was merely "latent" during the first stage, while in others the ordinary symptoms were masked by the presence of other diseases.

Of special medico-legal importance are those cases in which the symptoms are latent during the whole course of the disease, and in which the person affected dies suddenly and unexpectedly, while exhibiting no obvious sign of illness. It is under such circumstances that suspicion is apt to surround the death, and thus lead to investigations by the judicial authorities.

In the following table I have collected, from my notes on post-mortem examinations during the years 1888–90 and 1897–1901, thirty-three cases of what we may describe as true latent pneumonia. The table gives the essential particulars in regard to each, so far as I am able to do so, and the exigencies of space permit. Unfortunately, I have not kept a record of all such cases upon which a post-mortem examination has been made, otherwise the list would have been much larger; while again, with reference to the statistical aspects of the subject, it must be borne in mind that many sudden deaths during these years were certified without a previous post-mortem examination, when the circumstances offered no grounds for suspicion.

All of the cases in the subjoined table have the following characteristics in common, namely—(1) The disease was unsuspected during life, the sufferers having exhibited no sign of bodily weakness sufficient to attract the attention of those living in close relationship with them. (2) Death occurred suddenly, or followed within an hour or two after the appearance of serious illness, and before medical assistance was requisitioned. (3) The disease was well advanced, the lung, in the majority of instances, being in a state of grey hepatisation. It would be impossible to get a better illustration of what is meant by "latency" in the symptoms of an acute disease than that afforded by pneumonia.

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[1] "Latent Disease," "Cyclopædia of Practical Medicine," 1835.

We may, I think, fairly say that pneumonia is the most common, and at the same time the best known and most easily recognised, of all the acute febrile conditions. Its onset is rapid, and, as a rule, is characterised, even in the early stages, by well-marked symptoms—debility and prostration, high temperature, shortness of breath, cough, and rusty sputum. It is the disease, of all acute fevers, which we expect most certainly to disclose its presence by producing in the patient a feeling of illness and inability to continue in active occupation; and yet, in the cases herewith recorded, not only were these conceptions falsified, but the disease in most instances had advanced to such an extent as to implicate large portions of one or even both lungs, and had evidently been in existence for a considerable time prior to death.

It may perhaps be scarcely accurate to say that the disease gave no indication of its presence in all instances, since, in a certain proportion, strict inquiry from the friends disclosed that the deceased person had complained of a feeling of illness, sometimes of shortness of breath, pain in the side, cough, etc., but such complaints were indefinite in character and were usually not referred to again. These symptoms apparently never excited alarm amongst those to whom they were mentioned, and they were never such as to lead the sufferer to seek medical advice.

The sudden and unexpected character of the deaths was very striking. In several instances it took place during the night in bed, in others during the day, on the street, or at home, and in the latter cases it was frequently the apparent result of some slight effort or exertion, such as putting on clothes, or in the w.c., etc.; while, in the case of a prostitute, it resulted in the morning, after she had spent the night with a client. In a few cases death was not sudden, the deceased persons being seized with dyspnœa and collapse, quickly becoming unconscious, and dying in the course of an hour or two.

One fact of great significance stands out in relief, in considering the previous history and social condition of the persons affected, and that is the predominance of excessive alcoholic intemperance. Whenever it was possible, this subject was carefully inquired into, with the result that in seven cases no facts could be obtained, owing to the person being a newcomer in the town, or unknown; in one case, the deceased was strictly temperate; while in the remaining twenty-five cases they were constantly intemperate. The latter class, it will be seen in the table, have been subdivided into those (six) who were simply known to drink alcohol in excess whenever their circumstances permitted it, while the remainder (nineteen) are recorded as having been constantly intoxicated, and living in a state of debauch for several days prior to death. In view of the above facts, it is difficult to dissociate the influence of alcoholism, both from the causation of the disease and from being a prominent factor in the latent course which it pursued.

[*Continued on page* 325.

Case.	Date.	Sex.	Age.	History.	Alcohol.	Previous Symptoms.	Lung.	Extent and Stage of Disease	Other Conditions.
1	Nov. 1888	F.	59	Was going about as usual; died suddenly.	× ×	No complaints of feeling ill.	R. & L.	Both bases consolidated; red hepatisation.	Advanced atheroma of aorta; old adhesions of pleura.
2	Feb. 1889	F.	64	Was under treatment for psoriasis and stomach catarrh; death sudden.	× ×	No symptoms.	R.	Two upper lobes of right lung consolidated; grey hepatisation; dry pleurisy.	Cicatrix and old adhesions at apex of left lung; two gastric ulcers.
3	,, ,,	M.	59	*Brewer.*—Wrote two letters, and then retired to bed at 11 P.M.; died suddenly at 11.30.	×	Short of breath; cough for some days.	L.	Total consolidation, except small portion at apex; grey hepatisation.	Aortic valves thickened; atheroma of aorta.
4	Aug. ,,	,,	52	Working up to day of death; died suddenly in bed.	×	Short of breath; but made no complaints.	R.	Large areas of grey hepatisation.	Old pleuritic adhesions; liver hobnail.
5	Nov. ,,	,,	83	*No occupation.*—Never robust; went about as usual on day of death; found dead on floor.	×	Complained of "rasping on side."	R.	Right pleural cavity contained 2 pints of fluid with flakes of lymph: lung totally consolidated; grey hepatisation.	Old adhesions on left lung; aortic valves and first part of aorta atheromatous.
6	Dec. ,,	,,	64	*Painter.*—Came out of Infirmary three weeks before; treated for "dropsy"; since discharge drinking, but not able to work.	×	Complained of feeling unwell, and cough.	R.	Lower lobe and part of middle lobe consolidated; grey hepatisation; pleura covered with thick lymph.	Old adhesions on left lung; heart enlarged; aortic and mitral valves incompetent.
7	,, ,,	,,	44	*Draftsman.*—Going about up till evening of death; found dead in bed.	× ×	Complained of not feeling well and shortness of breath.	R.	Middle lobe and greater portion of upper lobe consolidated; grey hepatisation; thick lymph on pleura.	Left lung, old adhesions; small cavity at apex; liver fatty.
8	,, ,,	,,	63	*Labourer.*—Going about his work up till day before death; found dead in bed.	...	Complained of pain in side for a week.	L.	Whole of lower lobe and base of upper lobe consolidated; red hepatisation; pleura covered with thick yellow lymph.	Heart much enlarged; nutmeg liver.

× Chronic alcoholic intemperance.

× × Chronic alcoholic intemperance and special excess previous to death.

Case.	Date.	Sex.	Age.	History.	Alcohol.	Previous Symptoms.	Lung.	Extent and Stage of Disease.	Other Conditions.
9	Jan. 1890	F.	40	In poor health; assaulted by husband on 8th, died in bed on 11th; no apparent cause.	× ×	Not definite, and did not complain of being worse than usual after the assault.	R. & L.	Both bases consolidated; right base broken down and cavity formed, which had burst through pleura; fœtid; pleura of both lungs covered with thick lymph.	Pneumothorax.
10	,, ,,	M.	34	*Labourer.* — Strong and healthy; got bruise of back five weeks before, and was in Infirmary for a fortnight; found dead on floor.	×	Complained of weakness after coming out of hospital; went about but did not work; confined to bed on day before death.	L.	Whole of lower lobe consolidated; grey hepatisation.	Old adhesions on right lung; no fracture of ribs.
11	Dec. ,,	F.	64	*Hawker.*—Found dead in bed; had been staying in bed and drinking.	× ×	No complaints of feeling ill.	L.	Whole of upper lobe consolidated; grey hepatisation.	Heart muscle fatty; aorta dilated.
12	Jan. 1891	M.	60	*Cabman.*—Continued going about to day of death; found dead on floor.	× ×	Complained of pain in side a few days before.	R.	Two upper lobes consolidated; grey hepatisation; pleura covered with thick yellow lymph.	Old adhesions on left lung.
13	April ,,	F.	35	*Fish-hawker.*—Got up and dressed at 7.45 A.M.; took ill, and died at 8.30.	× ×	Complained of not feeling well previous day.	R.	Whole of lower lobe consolidated.	Left lung, extensive old adhesions.
14	May 1897	M.	49	*Strapper.*—At work day previous to death; died suddenly in bed.	×	Complained previous day of not feeling well while at work.	R.	Lower lobe consolidated; grey hepatisation; dry pleurisy.	...
15	June ,,	,,	67	*Shoemaker.*—Going about to day of death; died suddenly in afternoon.	...	Complained of not feeling well two days previously.	R.	Upper and middle lobes consolidated; red hepatisation; dry pleurisy.	Cicatrix at apex of right lung.
16	Oct. ,,	,,	40	*Barber.*—Dropped down dead in a shop; going about up to death.	...	No complaints of illness.	R.	Whole lung consolidated; grey hepatisation.	Atheroma of aorta; liver fatty.
17	,, ,,	,,	40	*Labourer.*—Discharged from prison day previous to death; died suddenly on way to poorhouse.	× ×	Complained of feeling ill on day previous to death and in prison, but appeared healthy.	L.	Upper lobe completely consolidated and covered with thick lymph.	Heart enlarged; fatty degeneration.

18	Nov. 1897	M.	40	*Old soldier.*—Found dead in house; had been going about as usual.	× ×	No complaint of illness.	L.	Lower lobe completely consolidated; grey hepatisation.	Heart and liver fatty.
19	Feb. 1898	,,	40	Died suddenly in prison cell; was violent, but did not appear to be ill.	×	Said his chest was sore.	R. & L.	Apices consolidated; red hepatisation; pleurisy on both sides.	Aortic valves thickened and incompetent; aorta atheromatous.
20	March ,,	,,	54	*Joiner.*—Worked up to 3 P.M. Saturday, then walked five miles and back; came home worse of drink; died suddenly at 8.30 A.M. on Sunday.	× ×	No complaints of illness.	R.	Base consolidated; red hepatisation.	Old tuberculous lesion at apex of left lung.
21	April ,,	,,	46	*Labourer.*—Died suddenly while putting on his clothes; going about as usual previously.	× ×	Said he felt ill on morning of death.	R.	Whole lung consolidated; grey hepatisation.	Old pleuritic adhesions on left side; aortic valves thickened; atheroma.
22	Nov. ,,	,,	39	Had been patient in Infirmary in June with Bright's disease; took ill at 2 P.M., and died at 3.30 P.M.; going about as usual, although not very robust.	...	No complaints of illness.	L.	Base consolidated; both bases covered with thick yellow lymph.	Aortic valvular disease.
23	Jan. 1899	,,	57	*Gardener.*—Died suddenly at 6.30 P.M.; having been going about up till 2 P.M. of same day in apparently normal health.	× ×	Complained of shortness of breath and cough two days before death.	L.	Lower lobe completely consolidated; grey hepatisation; pleurisy.	Aortic valvular disease.
24	March ,,	,,	35	*Labourer.*—Not working for a week; drinking and going about as usual; fell down dead in urinal of lodging-house.	× ×	No complaints of illness.	R.	Whole lung consolidated; grey hepatisation; covered with thick yellow lymph.	Purulent pericarditis.
25	Oct. ,,	,,	39	*Bar attendant.*—Found dead in bed at 12 noon; had been up and going about as usual at 8 A.M.	× ×	Complained of not feeling well five days before, but made no further complaints.	L.	All except apex consolidated; grey hepatisation.	Fatty degeneration of heart and liver.

× Chronic alcoholic intemperance.

× × Chronic alcoholic intemperance and special excess previous to death.

Case.	Date.	Sex.	Age.	History.	Alcohol.	Previous Symptoms.	Lung.	Extent and Stage of Disease.	Other Conditions.
26	March 1901	M.	53	*A tramp.*—Found dead in farm building; was in apparent good health.	?	?	L.	Lower lobe consolidated; passing into grey hepatisation.	Old adhesions of right pleura.
27	Oct. ,,	,,	42	*Old soldier.*—Going about as usual; became suddenly unconscious at 4 A.M., and died same day.	× ×	Complained for previous week of not being well.	R.	Upper two lobes consolidated; red hepatisation.	Advanced aortic and valvular disease.
28	Dec. ,,	,,	59	Found lying dead on floor in lodging-house in morning, fully dressed; was working on previous day in apparent good health.	...	No complaints of illness.	R.	Lung wholly consolidated except apex; grey hepatisation; thick yellow lymph on pleura.	Atheroma of aorta; commencing pericarditis.
29	,, ,,	,,	45	Found wandering in street; taken to police-office, and died in cells, suddenly.	?	Made no complaint of illness to police.	L.	Whole lung consolidated; grey hepatisation: covered with thick yellow lymph.	Pleurisy at base of right lung.
30	,, ,,	,,	50	*Gardener.*—Going about as usual; got up in morning, but lay down again, and died at noon.	× ×	Felt unwell on previous evening.	R.	Both lower lobes consolidated; grey hepatisation; pleura covered with thick lymph.	Aorta dilated; atheromatous.
31	Jan. 1902	,,	60	*Tailor.*—Apparently in good health; was found sitting dead in chair at 5 A.M.	× ×	Complained of not feeling well at 5 P.M. on previous evening.	R.	Upper two lobes consolidated; grey hepatisation; pleura covered with thick lymph.	Aortic valvular disease.
32	,, ,,	,,	63	*Labourer.*—Going about as usual; found dead in water-closet at 5 A.M.	× ×	Said he did not feel very well three days before death.	R.	Wholly consolidated; grey hepatisation; covered with thick lymph.	Atheroma of aorta.
33	Feb. 1902	F.	34	*Prostitute.*—Went with man to his home; next morning found dead on floor.	× ×	Was noticed to be short of breath and to have cough, but did not complain.	R. & L.	Both bases partially consolidated; grey and red hepatisation; thick lymph on both lungs.	Purulent pericarditis.

× Chronic alcoholic intemperance.

× × Chronic alcoholic intemperance and special excess previous to death.

Drunkenness leads not only to dangerous exposure to atmospheric conditions, but also tends to produce a peripheral vasomotor paralysis and dilatation of the capillaries of the skin, and thus greater radiation of heat from the body. Brouardel states that in cases of profound intoxication the temperature in the rectum has been found reduced to 75°·2 F. In addition, also, the oxygen-carrying power of the red blood corpuscles is reduced, so that the general nutrition of the tissues is lowered.

Notwithstanding modern views as to the specific nature of the disease, I do not think that we can deny the potency of a chill and diminished vitality of the tissues, if not in originating, at any rate in actively predisposing, to pneumonia.

Alcohol is, without doubt, also accountable for the absence, or masking, of the usual symptoms of the disease, by deadening the sensibility; and likewise it may be considered to explain, in virtue of its temporary stimulating effect, the extraordinary endurance and artificial strength shown by such persons during the subsequent progress of the disease.

In reference to the subject of alcohol, we are struck by the great difference between the usual alcoholic apical pneumonia and the cases under discussion. The former is rarely a cause of sudden and unexpected death, since it is seldom "latent" during its whole course. The patient becomes delirious or so markedly ill that medical advice is procured, and the condition recognised before death. The disease does not, as a rule, involve a great extent of lung substance, and the patient generally dies before the stage of grey hepatisation is reached.

In the cases we are now dealing with, however, the opposite is the rule. The disease may be entirely latent, it frequently causes sudden and unexpected death, its existence is not inconsistent with a state of apparent health, while the extent of lung involved may be very great, and death usually occurs in the stage of grey hepatisation.

These points of distinction appear to me to indicate an essential difference in the type of the pneumonia.

The statistics afforded by my cases are of course unreliable, owing to the small number embraced in them, but yet they are not without interest and importance. First, as regards—

Age.—The numbers are—

20 to 30 years	1 case.
30 „ 40 „	5 cases.
40 „ 50 „	10 „
50 „ 60 „	8 „
60 and upwards	9 „

The greater incidence above 40 years seems to support the view that a special cause is responsible for the occurrence of the disease, when we take into consideration the age periods of greatest prevalence of pneumonia, under ordinary conditions, and possibly alcohol may prove to be this exceptional factor.

Sex.—Of the thirty-three cases, twenty-seven were males and six females—a greater disproportion than is usual in pneumonia, but easily explained by the more frequent exposure and drunkenness found amongst members of the male sex.

Lung affected.—The right lung alone was pneumonic in eighteen cases, the left in eleven cases, and in four instances both were implicated.

Time of year.—Classified according to months, the following results are obtained:—

January	6	July	0
February	4	August	1
March	3	September	0
April	2	October	4
May	1	November	4
June	1	December	7

which gives in *winter* seventeen cases, *spring* six, *summer* two, and *autumn* eight.

The medico-legal relations of latent pneumonia do not differ from those connected with other forms of disease of a similar nature.

In some instances of sudden death, the discovery of a latent pneumonia will at once clear up the cause of death; in others, in which there may be justifiable suspicion of maltreatment, a decision as to the exact cause of death may be arrived at with greater difficulty; but the absence of any signs of contusion of the chest or fracture of ribs, together with a comparison between the date of the supposed violence and the stage of pneumonic consolidation of the lung, will usually enable us to form an opinion as to the relationship of the pneumonia to the injuries and to the production of death.

A case illustrative of this subject occurred in the Edinburgh Royal Infirmary many years ago, when Syme was at the height of his fame, and when he was served by a house surgeon destined to outshine his master—Lord Lister.

A man who had an exasperating habit, when drunk, of letting his lower jaw droop so that his mouth remained wide open, was sitting opposite his wife at the fireside. Irritated probably by his accustomed habit, or for other reasons, she suddenly seized the poker and made a lunge at him. The poker entered the mouth and struck the posterior pharyngeal wall. The man suddenly collapsed, and was removed to the Royal Infirmary, where Syme saw him on arrival, and surprised his surrounding listeners by oracularly stating that the patient would die suddenly. Nobody could understand the reason for this mysterious prophecy, nor did Syme condescend to throw further light upon the subject.

Next day, the man, while sitting up in bed taking dinner, suddenly fell back dead. Syme's dictum was recalled, and his wonderful prescience extolled. A post-mortem examination was ordered by the procurator-fiscal, and to the pathological theatre every one repaired, expecting to find the key to the mystery in a serious injury to the cervical vertebræ.

The cervical vertebræ were first removed and examined, but failed to disclose any cause to account for death. The thorax was then opened, and at once everything was explained, although hardly in the way that Syme and Lister expected, by finding advanced pleuro-pneumonia of both lungs. Needless to relate, no judicial proceedings were taken against the wife for causing the death of her husband.

Supposing, however, in the above case, the patient had lived for some time, and ulceration of the odontoid ligament had been found, then, notwithstanding the presence of the pneumonia, the question would have arisen whether the wife was responsible for the death of her husband, although he was suffering at the time from a disease which might, at any moment, have caused sudden death.

When latent pneumonia is found in the body of a person who has been seriously injured, although not necessarily fatally, questions of great nicety will arise as to whether death was due to the pneumonia or to the injuries. It must be perfectly evident, from the history of the cases I have appended, that a man may be brawling and going about with an advanced pneumonia. Should he, while in this state, suffer violence and die, the legal responsibility for his death will have to be fixed. Much will depend, in arriving at a decision, on the character of the injuries and their liability to result fatally in the given circumstances. If they are such as are not usually followed by immediate death, then we should be rather inclined to lay stress on the pneumonia, which we know is liable to cause sudden collapse and death after slight exertion, or even after emotions of anger, excitement, etc.; and we should be the more ready to give preference to such a cause, if the evidence indicated that the deceased was suffering from shortness of breath or other symptoms of the disease immediately before death. In conclusion, I would venture tentatively to make the following propositions:—

1. Pneumonia may be completely latent during its whole course.
2. The form of the disease most liable to be latent is basal lobar pneumonia.
3. Alcoholic apical pneumonia is rarely latent during its whole course.
4. The disease may be latent even although the whole of one lung, or a considerable portion of both lungs, is affected.
5. In latent pneumonia, sudden death most commonly occurs during the stage of grey hepatisation.

6. The condition is practically confined to persons addicted to excessive alcoholic intemperance.

7. Complete consolidation of the whole of one lung is not inconsistent with a person having continued to lead an active life up till the time of death.

8. Latent pneumonia is most frequent as a cause of sudden death during the winter months.

9. It is most common after the age of 40 and in the male sex.

10. The explanation of "latency" is to be found in the quantity of alcohol consumed after the onset of the disease—first, in masking the ordinary signs and symptoms by dulling sensibility; second, by its stimulating effect, thus enabling the person to go about until he suddenly collapses and dies.

11. In medico-legal cases, the discovery of latent pneumonia may satisfactorily explain the death of an individual, and thus allay all suspicion connected with the case.

12. On the other hand, the existence of pneumonia, even in an advanced stage, will not preclude the possibility of an individual having died from other causes, natural or violent, and of his having been, at the time of receiving an injury, in a state of apparent good health.

A FEW CASES ILLUSTRATING THE RESULTS OF OPERATIVE INTERFERENCE FOR FRACTURES ABOUT THE ELBOW-JOINT.

By W. Arbuthnot Lane, M.S., *Surgeon to Guy's Hospital and to the Hospital for Sick Children, London.*

(Plates II.–IV.)

I have picked out a few of the more complicated cases from a number of fractures on which I have operated, showing what may be done to remedy various forms of solution of continuity of the bones about the elbow-joint, and in doing so I have avoided selecting showy and very successful cases, but, rather than that, have chosen those that have made me hesitate as to the best mode of treatment or have caused me much anxiety.

Case 1.—Fig. 1, Plate II., represents a compound fracture of the lower end of the humerus, which came under my care several days after the injury. It was produced by a fall from a horse on the hard road. The skin and soft parts over the fracture were lacerated and fouled, and the fragments of bone projected outwards. The wound was treated as soon as possible after the injury, but it was recognised that the damage to the bone was too extensive to be met by other measures than a wiring together of the broken ends. He was sent up to London and placed under my care. The seat of fracture was freely exposed, when it was seen that there was extensive comminution, the fragments being very loose. The condition as shown in the radiograph was the best possible that could be obtained after much manipulation, and it was perfectly clear that if something were not done to restore the continuity of the humerus and so render the arm efficient, the patient, an officer, would have to resign his commission, a matter of very serious importance to him.

As the comminuted fragments were so much crushed and forced apart from one another by the force of the injury, very great difficulty was experienced in bringing their broken surfaces into any sort of accurate apposition, and the drilling and wiring entailed a considerable expenditure of time and trouble. The truncated lower extremity of the upper portion of the humerus was finally fitted and sutured more or less firmly into the interval between the lower fragments. Some trouble arose later from a lighting up of infection in the lacerated tissues, but this was met by prompt interference. The result is shown in Plate II., Fig. 2. The range of flexion and extension was not complete, but the angle through which the forearm could be moved upon the humerus was quite sufficient to allow of his joining his regiment in South Africa, where he has seen much service since. Here one had to deal not only with a large, foul wound, but with much crushing and laceration of the soft parts, and of the ends of the bone, rendering it impossible to fit the fragments together with perfect accuracy. This radiograph, being taken laterally, gives us no idea of the size of the wire loops, which was much greater than it appears here foreshortened.

Case 2.—The next case is that of a gentleman who was thrown from his horse, which, when he was on the ground, trod on the outer aspect of the right elbow. Fortunately, the ground was very soft, so that the skin and subjacent tissues escaped the laceration one would otherwise have expected from the animal's hoof. From a careful examination it was at once apparent that there was some fracture of the head of the radius, which interfered with flexion and extension of the forearm, and obliterating pronation and supination almost absolutely. He was sent up to London and placed under my care. The radiograph (Plate III., Fig. 3) showed that a portion of the outer and anterior segment of the head of the radius had been broken off and displaced forwards. If the fragment were left in this position he would not in future be able to flex or extend the arm beyond a very limited extent, and there would very likely be no possibility of his regaining movements of pronation and supination. Besides this, he was anxious to go abroad and lead an active life, which he could not do without a thoroughly useful arm. The treatment rested between excision of the fragment and of the rest of the head of the radius, or uniting the broken piece to the radius in its proper position. I cut down on the radio-humeral joint and divided the orbicular ligament vertically, separating its segments widely. The loose and detached fragment was then fitted accurately in its normal relationship into the gap left in the head of the radius, and was wired there by means of fine virgin silver wire. The cut ends of the orbicular ligament were sutured together, and the wound was closed. The progress he made was most satisfactory. After three weeks had elapsed, movements of flexion and extension of the elbow were commenced, and were steadily increased, no serious opposition being experienced. Later, pronation and supination were attempted. After a very moderate range of movement was effected, some resistance to further movement was experienced, and the resulting degree of rotation of the radius on its axis was inconsiderable. The result was, that while the patient was able to flex and extend the forearm almost perfectly, the rotation of the bones of the forearm on one another was far from perfect. He is now able to play cricket and shoot as well as before the accident. The skiagraph showed that some slight displacement of the fragments had ensued subsequent to the operation, and had probably resulted from my attempting to rotate the bones on one another before union had been sufficiently strong to resist the strain upon the adhesions which had probably formed between the opposing surfaces of radius and ulna. I believe that I would have ensured a perfect result if I had delayed movement till a later period, as it is possible that cartilaginous surfaces take a longer time to unite firmly together than bone does. At the same time, although I obtained what the patient considered an arm which he found perfectly useful for every purpose, I wondered whether, under these special conditions, it would not have been wiser to excise the remainder of the head of the radius. This I determined to try in the next case that came under my care, in order to obtain some definite facts as to results.

Such a case soon came under my care.

Case 3.—A gentleman was thrown heavily off his bicycle, falling, he believed, upon his hand, the arm being almost completely extended. He came under the care of a very able surgeon, who asked me to see him, a few days after the injury. He had had him radiographed without delay. This (Plate III., Fig. 4) showed that the patient had sustained a fracture of the head of the radius, the anterior half of which had been broken off vertically from the remainder of the head and horizontally from the upper limit of the neck. It had been displaced forwards in such a position as to render the arm quite useless unless some operative measure was resorted to.

Accordingly, the seat of fracture was freely exposed, and an endeavour was made to fit the fragment accurately in position. Owing to much laceration of the soft parts and to some irregularity of the margins of the bones, I found it very difficult to effect perfect apposition, and I therefore decided to remove the remainder of the head of the bone. This was done, and the wound closed. Recovery of movement was very much more slow and certainly more painful than in the last case. The result, after about two years, is that pronation and supination are almost perfect and powerful. Extension is nearly complete, flexion is limited to 90°, the resistance being apparently in the soft parts posterior to the joint. He plays golf, etc., with ease, and is quite satisfied with the articulation.

On the whole, the mechanical result is not as good as that obtained by restoring the head of the radius to its normal form, so that in future, unless there is some serious obstacle, I intend to wire on or otherwise secure the fragment, and take care that movement is not attempted till union is perfect.

CASE 4.—Fig. 5, Plate III., represents a condition one meets with very commonly in children. It presents, however, two features of interest. One was the very considerable outward displacement associated with the backward displacement which rendered the mechanics of the elbow-joint hopeless. The other was a lapse of about sixteen days since the receipt of the injury. These two circumstances combined to make the operative procedure much more trying than one usually finds it in this variety of fracture. The seat of fracture was freely exposed on its inner aspect, and, as was expected, much difficulty was experienced in replacing the fragment in a position, which was nearly but not quite perfect. It was then fixed in this relationship by a wire which passed through it and the inner limit of the shaft. The range of movement in the elbow-joint and the relationship of the bones of the forearm to the humerus seemed perfect. The subsequent progress of the case was very satisfactory.

As a rule, in this form of fracture an excellent working result with but a slight amount of deformity is obtained, if the arm be put up at once in a position of extensive flexion. I mention this as operative interference is often very difficult and sometimes unsatisfactory in young children, because of the cartilaginous condition of the fragment, which renders it very difficult to secure it in position without leaving a foreign body projecting into the cavity of the joint, and giving trouble later. It is the outward rather than the backward displacement that renders replacement difficult in some of these cases.

Another fracture about the elbow-joint that frequently calls for operative interference, especially in young life, is that of the radius in the upper part of its shaft. These cases are rarely operated on at the time the injury is sustained, but come first under the care of the operator when the splints have been removed. In the first instance the arm is put upon an internal angular splint, with the forearm in a position midway between pronation and supination, the hand being placed vertically, the thumb upwards. When this splint is taken off for the first time, it is found impossible to supinate and pronate the forearm. The patient is usually a child, and the mechanical depreciation, if at all marked, is sufficient to unfit it for many occupations, and especially for a service. Such cases come very frequently under observation, and require very careful operative treatment, since to restore the axes of the bone to their normal relationship the radius has to be divided in two oblique planes, which usually cross each other at an angle of about 90°.

Such fractures, when affecting the radius alone, show very little in a radiograph, unless it is possible to compare it with the condition of the other arm. This unfortunately multiplies plates, so I am illustrating this by a case in which the displacement is very considerable because of fracture of the ulna also.

CASE 5 (Plate IV., Fig. 6), in which, besides the fracture of the radius with much displacement of fragments, there is a fracture of the ulna in two places. This case did not come under my care till three months had elapsed since the receipt of the injury, when the arm was quite useless. The presence of an abundance of callus and the change in texture which the ends of the fragments had undergone, rendered our operative measures difficult and tedious. The bones were restored almost perfectly to their normal form, very extensive incisions having to be made to effect the restoration.

CASE 6 (Plate IV., Fig. 7) shows a fracture which is by no means uncommon though not often recognised. An officer was thrown off his horse, and dislocated both bones of the forearm backwards. The dislocation was reduced, and he was directed to move the elbow-joint freely. He was quite unable to do so, the arm being kept rigidly flexed at a right angle. He was regarded as neurotic, and, being unfit to continue on active service, was invalided home from South Africa. An examination of the elbow showed that flexion was opposed by the presence of a hard bony mass, which could be felt projecting forwards in the situation of the coronoid process, while extension appeared to be affected by the lump of bone being situated in or beneath the brachialis anticus. An examination under the X-rays confirmed this diagnosis, and showed that the apex of the coronoid process had been broken off at the time of the injury, and that an abundance of callus had formed about the displaced fragments and about the surface of the coronoid process from which it had been broken. If this had been recognised at the time the injury was sustained, it could have been treated perfectly and simply by screwing the detached fragments on to the remainder of the coronoid process. Of course this could not be done at this stage, so I had to satisfy myself by excising the fragment and callus till I was able to flex and extend the arm completely. Even then a very long time elapsed before the muscles and ligaments were sufficiently stretched and had become resilient enough to enable the patient to move his arm spontaneously and painlessly within a full range.

This case illustrates exceedingly well the advantages of a scientific operative treatment of fractures, over the old-fashioned feeble methods which have been adopted till quite recently. If this patient had been submitted to a simple operation, in the first instance, he would in all probability have been able to resume his duties in six weeks at the very outside, having had a painless convalescence, while as it is he has been lost to the service for at least a year, and his health has been seriously affected by the pain he had to endure in the attempts made to obtain movement before the operation, as well as after it. The surgeon who will not hesitate in the slightest to mutilate his patient to any extent to remove some of the mechanical disability resulting from a badly united fracture, cannot tear himself out of the groove in which his mind has been trained, sufficiently to restore the broken bone in the first instance to its normal form, and the physiology and mechanics of the patient to their normal state, because he cannot

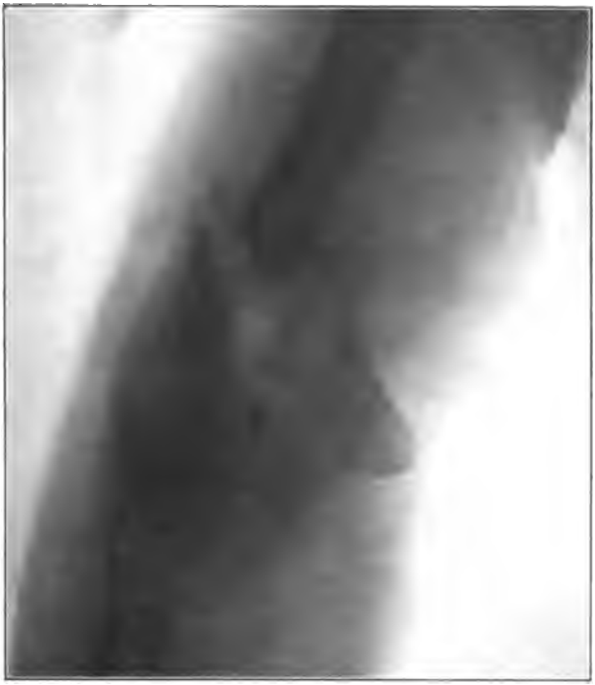

Fig. 1.

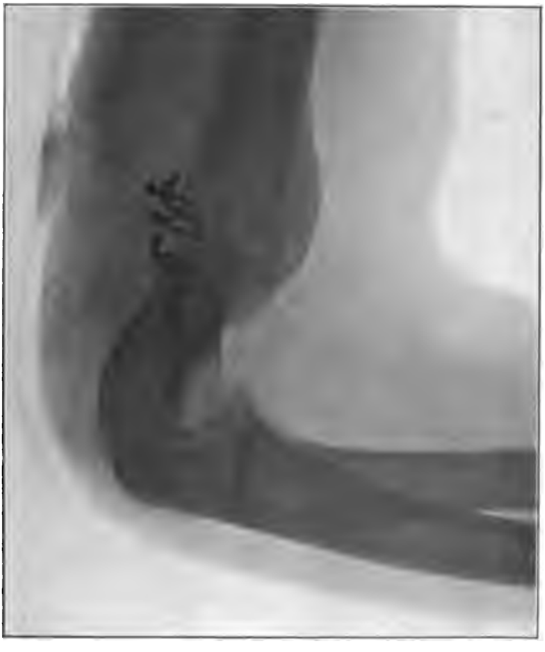

Fig. 2.

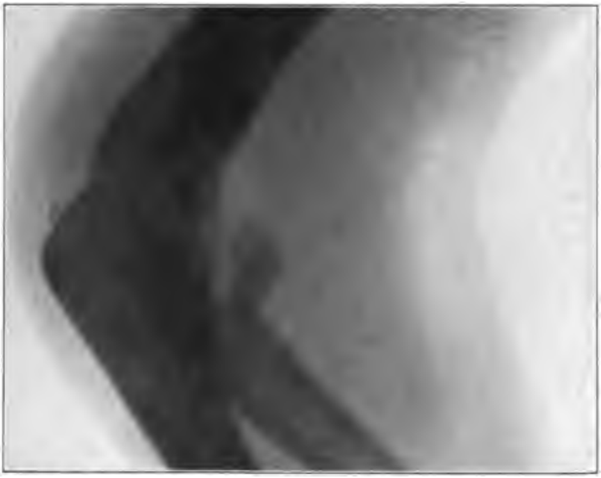

Fig. 3.

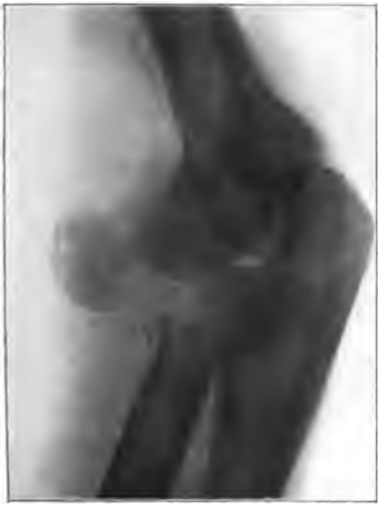

Fig. 4.

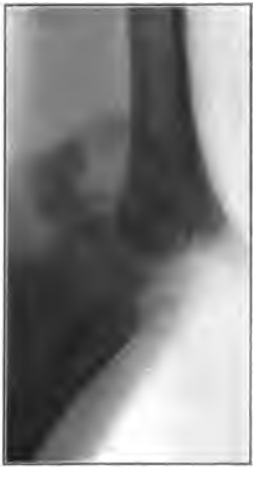

Fig. 5.

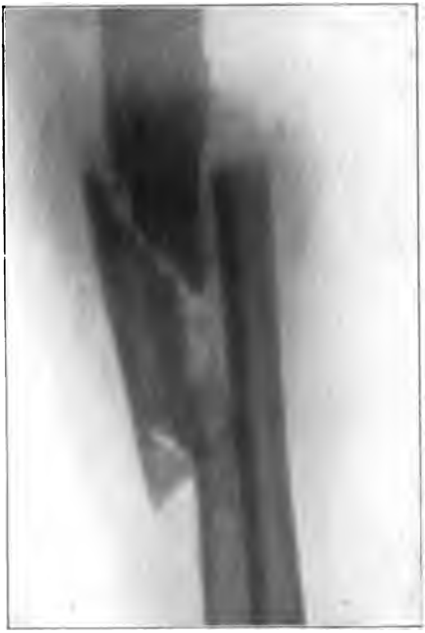

FIG. 6.

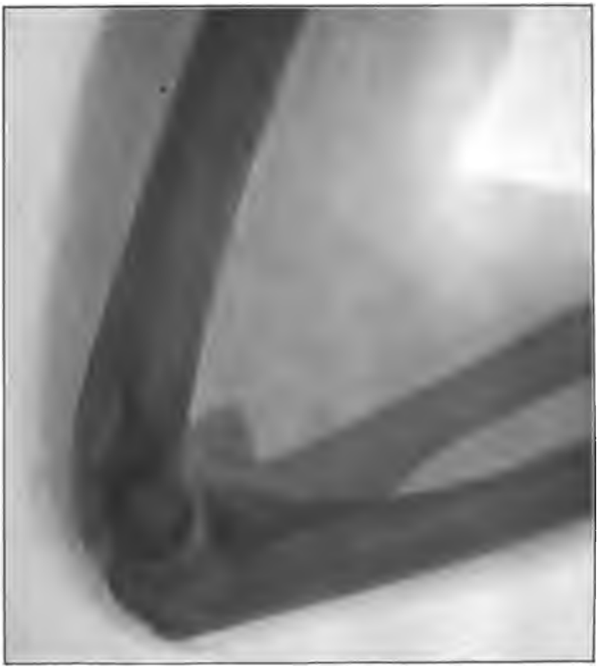

FIG. 7.

conceive it advisable to convert a simple fracture into what his conservative instinct defines as a compound one, forgetting that a so-called compound fracture is presumably in a large proportion of cases a foul wound, while the wound made by the surgeon to restore a fractured bone to its normal form should never be a foul one.

I would urge most strongly on those who intend to operate on these cases, two very important rules:

One is, "*Do not hesitate to make a sufficiently long incision,*" remembering that the length of incision adds nothing whatever to the risks or to the pain experienced by the patient, providing no important structure is cut through, and it enables the surgeon to thoroughly expose the fragments, and to bring and retain them in accurate apposition without offending the second rule, which is, "*Keep your fingers out of the wound.*"

If these two simple rules are observed, we will hear no more about the difficulty which many surgeons experience in the use of screws in recent fractures, where necessary or advisable, either in their not holding or in their working loose, and having to be removed, or in their being unable to bring the fragments into accurate apposition. I have seen radiographs of fractures which have been treated in this way, in which the screw has perforated fragments which were not in accurate apposition, but were overlapping one another. What practical object was hoped to be gained by such a procedure, it is difficult, if not impossible, to understand. The explanation lies in the fact that these operations are often very much more troublesome than can be conceived by the surgeon, who has been brought up on an utterly false and misleading creed, and, in plain English, he, being unfamiliar with the obstacles to be overcome, and perhaps also with the use of the screw, makes a hopeless muddle of the business.

Regarding the treatment of fractures by means other than operation, I think it might fairly be asked of those in charge, that every case, when put up, should be carefully examined on the screen and radiographed in the worst position. As I have said before, I have no doubt that the law courts will seriously interfere with the continuance of old methods, and hasten the general application of new ones.

I would like to call attention to an excellent address on this subject, delivered at the opening meeting of the Surgical Section of the Royal Academy of Medicine, Ireland, by Mr. Myles, the President of the Royal College of Surgeons of Ireland. It is entitled "Operative Treatment of Fractures," and is published in the *Clinical Journal*, 19th February 1902. It will be seen that Mr. Myles has treated the question in just the manner that a most skilful and progressive surgeon, confident in the perfection of his aseptic precautions, and thoroughly familiar with the difficulties of the subject, would.

THE HEART IN DIPHTHERIA.

By CHARLES BOLTON, B.Sc., M.D., *Resident Medical Officer, University College Hospital.*

CARDIAC failure is one of the most important as well as the commonest of the toxic effects of diphtheria. A large majority of patients have at some time or other, during the course of the disease, signs of heart failure, and death during the acute toxic stage invariably results from primary cardiac failure, excluding, of course, an accidental cause, as asphyxia or lung disease owing to involvement of the larynx. Since the introduction of antitoxin into the treatment of diphtheria, it is much less common than formerly to see death resulting from implication of the larynx, a larger proportion of these cases being saved than in the pre-antitoxin days; and it may be stated that now the majority of deaths from diphtheria are the result of heart failure, for it cannot be doubted that many of the cases which now show signs of cardiac failure would have died had they been treated without antitoxin.

Although in diphtheria the acute toxic stage is not sharply separated from the convalescent stage by a fall of temperature or marked alleviation of the constitutional symptoms, the one blending insensibly with the other, it is advisable to speak of cardiac failure as occurring in the acute and convalescent stages respectively, because in these two stages it presents differences which will be referred to later on. In the milder cases, as soon as the fauces are free from membrane, the acute stage may be said to have ended, and the patient to be convalescent; in the more severe cases the membrane takes longer to separate, and even though the throat may have been clean for several days, the patient may still die from the acute toxæmia. The general statement may be made, that in acute diphtheritic toxæmia, when uncomplicated, death usually occurs within the first fortnight of the disease, life being prolonged a day or two over this period in a few cases; hence the patient can never be said to be safely over the acute stage of diphtheria until after the first three weeks.

Cardiac failure in diphtheria either leads to death by syncope, which may be quite sudden but is generally preceded by a progressive failure of the heart, or is rendered manifest by some disturbance in the regularity and alteration in the frequency of the pulse, with or without the physical signs of cardiac dilatation. Œdema and other symptoms of heart failure have been described, but these, if they ever occur, must be extremely rare.

HEART FAILURE LEADING TO DEATH.—*Death from acute diphtheritic toxæmia.*—As stated above, death resulting from the severity of the toxic poisoning is due to a primary failure of the heart.

The class of cases which die in this way comprises essentially the severe faucial cases, in which the nose is usually also involved, and sometimes the larynx. Primary laryngeal cases rarely show heart failure, whereas wound diphtheria is very fatal through cardiac failure. Cases of severe toxæmia in which there are subcutaneous hæmorrhages, with or without bleeding from the mucous membranes, are apparently always fatal during the acute stage, from progressive heart failure. On looking up the records of the cases which have died in this manner in University College Hospital during the past eight years, I find that the average time of death was the tenth day of the disease, the earliest being the third or fourth, and the latest the fifteenth day; and it may be stated generally that, except in a few cases, death usually takes place some time during the first fortnight of the disease.

Heart failure in the majority of cases sets in a few days before death; and although death may occur on the same day as the first signs are noticed, yet life may be prolonged for a week or even longer after the symptoms of heart failure have appeared, and all hope of saving the patient has been abandoned. The time of onset of the cardiac failure in these cases is some time during the first week of the disease, especially about the sixth day.

The first sign is noticed in the pulse, which becomes irregular in force and rhythm, the compressibility being always increased. It is as a rule rapid, but at times it is slow. Sometimes before death it becomes remarkably slow, and this slowing is a very fatal sign. The pulse becomes progressively weaker and more irregular till it is imperceptible, and in this condition the patient may linger for hours or even days, to finally die from syncope. Whilst the pulse is irregular the patient may die quite suddenly if any extra strain is thrown upon the heart, as for instance vomiting or struggling. The cardiac impulse may be diffuse and slapping, but this is not always seen. Occasionally the patient may experience severe præcordial pain, which is by no means common. The face is remarkably pale and waxy looking, the lips are cyanosed, and, as the pulse fails, the extremities become cold and the patient restless; the respirations sometimes have a peculiar sighing character. Consciousness is retained to the end, the patient in some cases looking quite bright, so that the friends are hopeful and will not believe the prophecy of death. Vomiting may or may not occur, and, when it does, it usually commences after the irregularity of the pulse has indicated the onset of heart failure. The urine generally contains albumin, and in a few cases it may be entirely suppressed for a day or more before death. The temperature in the worst cases is often low.

As an example I will quote the following case:—

CASE 1.—V. P., female, æt. 5; admitted to University College Hospital, 17th March 1901. The illness commenced on 11th March with headache, a sore throat being first noticed on 15th March. On admission, the tonsils, uvula, and part of the soft palate were covered with blackened membrane; the breath was foul, and the cervical glands were enlarged on each side; there was a little rhinorrhœa. The face was very pale, the lips were a little cyanosed, and there were several subcutaneous hæmorrhages on the trunk and limbs; the patient was prostrate but perfectly conscious. The pulse was very irregular in force and rhythm, 128 in frequency, and at times almost imperceptible. The cardiac impulse was a little diffuse, the sounds being feeble and corresponding with the pulse; no murmurs were present. The lungs were normal, and there were no symptoms of laryngeal involvement. The urine contained a thick cloud of albumin. The temperature was 103°. Antitoxin, 9000 units administered on admission.

Progress.—The pulse became progressively weaker, and at noon on the following day was quite imperceptible; the extremities were cold; the patient became restless, and died at 4.30 P.M. (eighth day of disease). There was never any vomiting, and 7 oz. of urine were passed, between admission and death. On the last occasion that the pulse could be counted it was 116 in frequency.

In very many cases the signs of toxæmia are not so much in evidence. The throat may have become quite clean and the patient appear to be perfectly well, when the pulse will become irregular and the heart progressively fail, death occurring in the manner described above. It is the opinion of the writer that these are cases of a milder degree of toxæmia, many of which would probably have recovered had antitoxin been given at an earlier period of the disease.

The next case is very instructive, as affording an example of the effect of vomiting upon the heart. On the eleventh day of the disease vomiting began, and the heart then showed marked signs of dilatation; on the thirteenth day an attack of vomiting determined death by sudden syncope.

CASE 2.—L. F., female, æt. 8½; admitted to University College Hospital, 12th September 1901. The onset of the disease was 7th September; and on admission the tonsils, uvula, and faucial pillars were covered with thick discoloured membrane; there was profuse rhinorrhœa with excoriation of the nostrils, and the cervical glands were enlarged on each side. A subcutaneous hæmorrhage was present on the right leg. The pulse was weak but quite regular, and the cardiac impulse was in the fifth left intercostal space internal to the nipple. Temperature 101°·6. Antitoxin, 8000 units administered.

September 13.—Pulse 128 in frequency, and a trifle irregular in force and rhythm. Bleeding from the vagina, epistaxis, and a subcutaneous hæmorrhage on the left shoulder.

September 14.—Pulse 144, irregular. Cardiac impulse extends to nipple line. 12 oz. of urine, mixed with blood, passed since admission.

September 15.—Pulse 108, much weaker, but at present more regular. Two fresh subcutaneous hæmorrhages.

September 17.—Vomiting commenced, and now the cardiac impulse was ½ in. outside the nipple line; no murmurs. Pulse 120, irregular.

Fauces almost clean, a small patch of membrane still adhering to the right tonsil. A fresh hæmorrhage. Vaginal bleeding.

September 18.—The pulse is much weaker and more irregular. On the whole the rate is slower, varying from 78 to 104; and on examining the pulse every hour, its irregularity is found to vary considerably during the day, sometimes being almost regular, and soon after becoming extremely irregular. Cardiac impulse still half an inch outside nipple line. The extremities are cold and the face is very pale, but the child is quite bright and conscious. Vomited twice.

September 19.—This morning patient asked for a little jelly, and shortly afterwards vomited considerably, when the pulse suddenly became imperceptible, the face livid, and the pupils dilated; the heart could not be heard, and after a few gasps at intervals the patient was dead (thirteenth day of disease).

The next case illustrates a slowing of the pulse before death.

CASE 3.—L. D., female, æt. 3; admitted to University College Hospital on 27th June 1901. The onset of the disease was 24th June, and on admission there was membrane covering both tonsils and faucial pillars; a little rhinorrhœa, and enlargement of the cervical glands on both sides; several subcutaneous hæmorrhages. Antitoxin, 6000 units administered, and repeated on the two following days.

June 28.—Pulse irregular, and especially so after syringing the throat.

June 29.—Pulse 108 to 130, weaker and more irregular. Hæmorrhage from the bowel.

July 1.—At 11 P.M. last night the pulse was found to be 60. At 3 A.M. this morning it was 62, and at 7 A.M. it was 58; after this the patient was pulseless, and died quietly during the afternoon (eighth day of disease).

Cardiac thrombosis.—Cardiac thrombosis is a rare cause of death in diphtheria. It was formerly thought that sudden death in this malady was due to this cause, but the fallacy of this view is now apparent.

Three cases of cardiac thrombosis are recorded by Dr. Woollacott;[1] the first of which I had the good fortune to witness, whilst a medical officer at the Homerton Fever Hospital. They were all severe cases, one being complicated by scarlet fever and suppurative adenitis, and the other two by faucial ulceration, so that a secondary infection was possible in each case. Two died within the first three weeks of the disease, and the third on the twenty-sixth day. From these cases it appears that the chief symptoms of this condition are severe præcordial pain, with some variety of altered respiration and restlessness, the onset of the pain being more or less sudden. Sudden death did not occur, the heart failure being gradual, and the patients surviving for several hours after the onset of the pain. The pulse was rapid but regular before the heart began to fail, and, when the heart dilated, the pulse became irregular. There was vomiting in each case preceding the above symptoms. Paralysis was present in two of the cases.

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[1] *Lancet*, London, 1899, vol. i. p. 1217.

In two of the cases infarcts were present; in one, in the kidney and spleen, the thrombus being situated at the apex of the left ventricle; and, in the other, the infarcts were in the lung, a thrombus being found at the apex of each ventricle and in the right auricle. In the case without infarction the clot was situated in the right ventricle at the apex, and in the right auricle. The clots were breaking down, and had evidently been there long before the onset of the pain, which Dr. Woollacott attributes to dilatation and distension of the heart.

Embolism of the popliteal artery, with gangrene of the limb, and hemiplegia due to cerebral embolism, have been recorded in diphtheria.

It is quite conceivable, as Dr. Woollacott points out, that sudden death might easily arise; but such was not the course of events in these cases.

Death during convalescence.—After the acute stage of the disease has passed, death from heart failure is usually associated with paralysis, and is especially seen in cases of generalised paralysis affecting the palate, pharynx, larynx, and diaphragm. It is by no means the invariable rule for patients extensively paralysed to die from heart failure, as many die from lung complications; and, when this does happen, the heart failure is frequently found to be secondary to some strain, as for instance vomiting or the shock caused by severe pain, as in a case of which I have knowledge in which very severe pain in the loin, with hæmaturia due to gravel in the kidney, undoubtedly accelerated the death of the patient; or it may be secondary to paralysis of the respiratory muscles, and probably this is the commoner mode of death in paralysis. In other cases the heart failure is only a part of the generally enfeebled condition of the patient, and presents no peculiarities. This is especially seen in those cases of marked wasting in which food cannot be retained by stomach or rectum. The heart failure in these cases of paralysis is evidenced by irregularity of the pulse, as in the acute stage, but there is no progressive enfeeblement of the circulation and death within a definite period of time as in the acute toxic cases. At this late period of the disease it is by no means so uniformly fatal, as a patient may be rendered pulseless by vomiting, and yet recover.

Sudden death.—Sudden death from syncope may occur at any stage of diphtheria, but the most alarming cases are those which occur when convalescence is established and the patient is thought to be quite free from danger. These sudden deaths are all referable to some strain which has been thrown upon a heart which is unprepared to meet it.

As will be shown later, primary heart failure, unassociated with paralysis, occurs at an early period of the disease, and is manifested in the milder cases chiefly by irregularity of the pulse; in some cases this irregularity is very persistent, and may last for many weeks, the patient all the while appearing to be and feeling perfectly well, and therefore all the more likely to encounter strain. Strain will determine the onset of cardiac dilatation and irregularity of the pulse in a patient who has previously shown no signs at all, and it is therefore not surprising that sudden death should occasionally occur in patients who have up to then appeared in perfect health. It is probable, if the heart and pulse were carefully examined in many of these cases, that some signs would almost invariably be found.

Seven cases of this nature are described by Dr. Lees,[1] of which I will quote three:—

> "A child of 3 years of age had suffered from diphtheria, but was thought to be convalescent. She was standing by a window, when some one entered the room a little abruptly. She turned quickly round, and fell dead on the floor."
>
> "A medical man in good practice attended a child for diphtheria. As she did not recover as quickly as he expected, he sent her to the seaside for change of air. She fell dead on the sands."
>
> "A girl of nearly 11 years old had a severe attack of diphtheria. She looked pale after this, and was kept in bed for eight weeks. She was then allowed to rise. In five minutes after rising she was dead."

HEART FAILURE NOT LEADING TO DEATH.—A very large proportion of patients suffer from cardiac failure at some stage of the disease, and this is evidenced by irregularity or intermittence of the pulse, with or without the physical signs of dilatation of the heart. It is rare to have pain or other symptoms, the patient in most cases feeling quite well, and in many cases being quite lively, whilst the pulse is irregular. Primary heart failure occurs most commonly during the acute toxic stage of the malady, and at this period it may be associated with an early onset of paralysis.

Cardiac failure in the acute stage.—The first signs of heart failure are commonly noticed between the end of the first week and sometimes during the third week of the disease; a large number of cases commencing at the end of the second week. In some cases they may be seen as early as the fourth day.

The pulse is on the whole rapid and compressible, and becomes more or less irregular; it remains irregular for about two to six weeks, but the irregularity may last for four to five months, or, on the other hand, for only a little over a week. The heart may show signs of dilatation.

In the following case the pulse became irregular on the fifth day, and was quite normal again on the fourteenth day, the heart showing no signs of dilatation.

CASE 4.—E. H. B., male, æt. 5; admitted to University College

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[1] *Brit. Med. Journ.*, London, January 5, 1901, p. 7.

Hospital on 14th November 1901. The onset of the disease was 11th November, with vomiting and feverishness. On admission, there was a patch of white membrane on each tonsil, on the left side spreading to the adjoining part of the pharynx, and a little on the uvula. There was no rhinorrhœa. The cervical glands were a little enlarged on each side. Temperature 100°·4. The pulse was quite regular and the heart normal. Antitoxin, 6000 units administered.

November 15.—The pulse has become irregular; no signs in the heart; a cloud of albumin in the urine.

November 19.—Fauces quite clean; pulse still irregular.

November 24.—Pulse again quite regular; knee-jerks present; no signs of paresis.

December 27.—Discharged quite well; no other symptoms having developed.

During the period of irregularity the pulse was examined every hour, and varied in frequency from 70 to 120 during the twenty-four hours, being quite regular at times. On the whole the irregularity was associated with a slowing of the pulse, but this was by no means an absolute rule. Towards the end of the time the pulse became irregular about once a day only.

Some of the readings for November 17 are as follows:—

Time.	Frequency.	Regularity.
3 A.M.	80	Regular.
6 ,, ...	94	Somewhat irregular.
11 ,, ...	84	Slightly ,,
7 P.M.	...	,, ,,
8 ,, ...	78	,, ,,
9 ,, ...	120	Regular.
9.30 ,, ...	74	Irregular.
10.30 ,, ...	80	Much less irregular.

When the heart shows the physical signs of dilatation, the cardiac impulse is displaced outwards towards the left anterior axillary line, and is more or less diffuse and slapping in character. The percussion note extends a little further to the left than normal. On auscultation the first sound is short and sharp, and sometimes a systolic murmur may be heard at the apex, the pulmonary second sound being accentuated. The point on which most stress should be laid is the diffuse character of the cardiac impulse and its displacement outwards, especially when it has previously been found in the normal situation.

In the following case the pulse became irregular on the ninth day of the illness, and was quite normal on and after the forty-eighth day. The heart showed signs of dilatation on the ninth day, and was normal again on the thirtieth day. After the fauces were clean the child was quite well and lively, and it was only on examining the heart and pulse that anything could be found amiss.

Case 5.—S. B., female, æt. 5½. Admitted to University College Hospital on 4th November 1901. The onset of the disease was 31st October. On admission there was a patch of white membrane on each tonsil, the uvula and soft palate being quite clean. There was no rhinorrhœa, and the cervical glands were enlarged on each side. Pulse 100, and quite regular. Cardiac impulse in the fifth left interspace internal to the nipple. Temperature, 100. No albumin in the urine. Antitoxin, 8000 units administered.

November 8.—Fauces quite clean. The pulse became irregular at 4 A.M., and on examining the heart at 11 A.M. the impulse was in the anterior axillary line; there were no murmurs; the first sound was practically normal, and the pulmonary second sound was accentuated. Knee-jerks present; no signs of paresis.

November 13.—Cardiac impulse just external to the nipple line; pulse irregular.

November 15.—A systolic murmur heard at the apex; impulse in the nipple line.

November 18.—Impulse again outside nipple.

November 20.—Impulse in nipple line.

December 3.—Up to this date the pulse had been more or less irregular all day, but after this it became quite regular during the whole day, and was only irregular at night; this irregularity gradually disappeared by the 18th December, when the patient was discharged quite well. The knee-jerks were present during the whole of the time, and there were never any signs of paresis; there was never any albumin in the urine. During the period of irregularity the pulse was examined frequently during the day and night, and was found to vary very much both with regard to frequency and irregularity. On the whole, the irregularity was more marked with a slow than a rapid pulse, although sometimes it was quite as evident in the latter case; and on the whole the pulse was both slower and more irregular during the night than during the day.

The following figures represent the record from 5 A.M. on 13th November to 8 A.M. on 14th November:—

Time.	Frequency.	Regularity.
November 13—		
5 A.M.	71	Very irregular.
7 ,, ...	120	Regular.
8 ,, ...	90	Irregular.
9 ,, ...	...	Slightly irregular.
11 ,, ...	86	,, ,,
3 P.M.	96	,, ,,
5 ,, ...	108	Regular.
9 ,, ...	82	Irregular.
10 ,, ...	79	Slightly irregular.
November 14—		
2.30 A.M.	66	Very irregular.
4 ,, ...	88	Irregular.
6 ,, ...	104	Regular.
7.15 ,, ...	96	Slightly irregular.
8 ,, ...	89	Irregular.

When paralysis comes on in the acute stage of the disease, it is usually preceded by some irregularity of the pulse.

In the following case the pulse became irregular on the sixth day of the disease, and on the thirteenth day paralysis commenced. The pulse was still irregular on the hundred and twenty-fourth day when the patient was discharged, and the knee-jerks were also absent; the paralysis disappeared on the seventy-fourth day. The heart showed signs of dilatation about the same time as the pulse became irregular. The irregularity of the pulse was not preceded by vomiting, which sometimes happens in these cases.

Case 6.—A. G., female, æt. 3 years and 7 months. Admitted to University College Hospital on 29th August 1901. The onset of the disease was 27th August. On admission there was a large gelatinous-looking piece of membrane on the right tonsil; profuse rhinorrhœa with enlargement of the cervical glands on both sides. Pulse 103, and quite regular; heart normal. Temperature, 103. Urine free from albumin. Antitoxin, 8000 units administered.

August 31.—Membrane has extended to the uvula and left tonsil; pulse quite regular. Antitoxin, 8000 units administered.

September 1.—Pulse irregular in force and rhythm, and compressible; cardiac impulse in fourth left intercostal space in nipple line.

September 2.—Impulse outside nipple line, and an apical systolic murmur present; knee-jerks present.

September 8.—Fauces clean, a little superficial erosion of the mucous membrane being present at the base of the uvula. Nasal voice, but palate moves a little on phonation; pulse more irregular.

September 9.—Palate quite motionless; pulse is less irregular since syringing of the throat has been stopped.

September 17.—Patient is very languid and limp. Cardiac impulse ¾ in. outside nipple line; systolic murmur still present.

September 24.—An occasional strabismus is noticed to-day.

September 27.—Marked internal strabismus; pupils dilated.

October 2.—Knee-jerks absent for first time. Cardiac impulse in the nipple line. Breathing during the night was very irregular, and frequently interrupted by pauses. Diaphragm acts quite normally.

October 13.—The breathing has frequently been irregular during the night. Squint disappearing; pulse still irregular.

October 18.—Cardiac impulse outside nipple line.

November 8.—Squint practically gone; voice normal and palate moves well. Knee-jerks absent; child much more lively and stronger. Cardiac impulse in nipple line.

December 16.—Child quite well; knee-jerks, heart, and pulse as before.

December 28.—Patient contracted scarlet fever and was sent to the fever hospital, the knee-jerks still being absent and the pulse irregular. The pulse in this case varied in the same manner as in the two previous cases. It rapidly changed from a condition of regularity to irregularity several times during the day, and the frequency also varied considerably; the irregularity in this case occurred more often with a rapid pulse than in the two previous cases. Towards the end of the time the pulse was irregular only during the night. When the child started vomiting at the onset of the scarlet fever, the pulse was very irregular during the whole morning, and after the vomiting ceased it regained its former condition.

On 26th November some of the pulse records were as follows:—

Time.	Frequency.	Regularity.
November 26—		
7 A.M.	100	Regular.
8 "	97	Slightly irregular.
8.45 "	...	Regular.
11 "	100	Slightly irregular.
3 P.M.	76	Very "
9 "	96	Slightly "
November 27—		
7 A.M.	96	Regular.

I have examined the pulses of very many other cases, of which the above are examples, in the same way, and have found them to agree in the following facts:—

1. During the twenty-four hours the pulse alters considerably in both degree of irregularity and in frequency.

2. These changes occur frequently, and often at very short intervals (half an hour or so); sometimes the change can be noticed under actual observation, and it often appears as if the irregularity comes on in definite attacks.

3. On the whole the irregularity is most marked at night, and usually persists during the night after the pulse has become quite regular during the day.

4. As a rule, when the pulse becomes irregular, there is a diminution in its frequency, but this rule is by no means absolute. Sometimes the pulse may be irregular when the frequency is increased or diminished, and in other cases the pulse is rapid all the time.

5. The irregularity coming on in the acute stage is a primary affection, but is nevertheless greatly affected by strain, as vomiting and struggling when the throat is syringed or food administered by the nose.

6. The irregularity does not conform to any type; every variety and degree of irregularity, with sometimes intermittence, occur together.

7. As a rule the patient appears quite well, and suffers no inconvenience or distress on account of the heart failure.

In the following case there were undoubtedly attacks of heart failure. On the eleventh day of the disease vomiting commenced, and the pulse became irregular; paralysis started on the sixteenth day. The attacks were certainly not in any way connected with the entrance of saliva or food into the larynx, as there was no coughing or other symptom of respiratory disturbance.

Case 7.—A. P., male, æt. 2; was admitted to University College Hospital on 17th March 1901. Onset of the disease was 16th March, and on admission there was membrane on both tonsils and uvula, with enlargement of the cervical glands on each side. The voice was a little hoarse, and there was a trace of recession of the lower portion of the chest. Pulse quite regular and heart normal. Temperature 99°. The urine contained half albumin on boiling and setting aside. Antitoxin, 6000 units administered.

March 21.—Fauces quite clean.

March 26.—Occasional vomiting; pulse irregular.

March 31.—Several times during the day the child has become cyanosed, the pulse being barely perceptible. Palate does not move very freely. No change in the character of the respirations. Cardiac impulse in the fifth interspace outside the nipple line.

April 13.—Internal strabismus. The attacks of cyanosis and pallor of the face with a feeble pulse continue.

April 17.—Knee-jerks absent. Diaphragm normal. No signs of paresis anywhere except the eyes and palate.

April 22.—Child is generally limp. Vomited twice during the day. Has not had a bad cyanotic attack for ten days.

April 26.—Vomiting stopped, and pulse perfectly regular; still very limp, but paralysis is clearing off. After this, recovery was gradually completed.

Apart from irregularity, the frequency of the pulse may be affected alone. As a rule, in acute diphtheria the pulse is as a whole rapid, but exceptionally it may be slow.

In the following case the pulse was rapid till the eighth day of the disease, after which for a fortnight the highest record was about 72 in the morning, and later in the day it varied between 48 and 64; the frequency rose after this, but until the date of discharge it sometimes fell to 60 at night.

Case 8.—N. H., female, æt. 10; was admitted to University College Hospital on 2nd September 1901.—The onset of the disease was 31st August, and on admission the right tonsil was inflamed and the left covered with thick membrane, at the upper part creeping on the soft palate. The cervical glands were enlarged on each side, and there was slight rhinorrhœa. The cardiac impulse was in the fifth left intercostal space internal to the nipple line, and the sounds were normal. The pulse was 124 and regular. Temperature, 100°·4. No albumin in the urine. Antitoxin, 8000 units administered.

September 6.—Fauces clean.

September 8.—Slight nasal voice; pulse slow during the night.

September 10.—Nasal voice distinct; palate not drawn up on the left side on phonation; knee-jerks present; pulse regular but slow during the night.

October 12.—No other signs of paralysis have developed, and for the past few days the voice has been normal; knee-jerks have never been lost. The frequency of the pulse has risen, and for the past two days it has not been below 76, the highest record being 92. The patient made an uninterrupted recovery.

Cardiac failure during convalescence.—Heart failure, as evidenced by an irregular pulse, with or without signs of dilatation, is as a rule associated with paralysis during this period of the disease; or it may be determined by some strain which is thrown upon the heart, as for instance getting up too early, undue excitement, or vomiting. It may come on as late as six or eight weeks after the onset of the disease. Tachycardia is sometimes seen during convalescence; slowing of the pulse is less common.

Irregularity of the pulse may occur after the paralysis is established; or the paralysis may be preceded by an irregular pulse, which is often determined by vomiting.

The following case of paralysis preceded by an irregular pulse will be quoted, as it is unique in that the paralysis was limited to the external ocular muscles:—

Case 9.—I. S., female, æt. 4; was admitted to University College Hospital on 15th September 1901. The onset of the disease was 10th September. On admission there was yellowish grey membrane on each tonsil; the cervical glands on each side were enlarged; there was hoarseness of the voice, with stridor and retraction of the lower part of the chest. The pulse was regular, and the cardiac impulse internal to the nipple, the heart sounds being normal. Temperature, 99°·4. A cloud of albumin in the urine. An asphyxial attack occurred, and tracheotomy was performed. Antitoxin, 8000 units administered. After this the child coughed up membrane through the tube, and on 24th September there were present the physical signs of pneumonia. The tracheotomy tube was removed the next day, and on 4th October the signs of pneumonia had disappeared; the pulse was quite regular, the knee-jerks present, and the child lively and well. On 12th October the pulse became irregular, and on 19th October there was marked internal strabismus, the palate was normal, and there were no other signs of paresis; accommodation was normal, as the child could shove a pin through a tiny hole in a piece of paper at every attempt quite easily and without hesitation; the knee-jerks were present, and there were no signs of cardiac dilatation. The squint had practically disappeared on 29th October, and on 6th November the pulse was quite regular. There were never any other signs of paralysis, and the knee-jerks were never lost. The child was discharged, and on 29th November was brought up to the hospital for inspection; she was then perfectly well.

In this case the pulse was very frequently examined, and was on the whole more uniformly rapid than in those previously quoted, and no definite relation of irregularity to any particular degree of frequency could be detected; it changed considerably during the twenty-four hours, and finally became quite regular by day, whilst still irregular at night.

As an example of the effect of strain, in determining the onset of heart failure, the following case will be quoted; it is also interesting in that the patient finally developed marked ataxy of the legs.

Case 10.—S. W., female, æt. 12; was admitted to University College Hospital on 9th October 1900. The onset of the disease was 6th October, and on admission both tonsils, uvula, and part of the soft palate were covered with membrane. The pulse was quite regular, and the heart and urine normal. Temperature, 99°·8. Antitoxin, 8000 units administered. On 16th October the fauces were clean, the pulse quite regular, and the heart normal. On 22nd October the patient was allowed to get up in blankets, sitting in a chair; four days later the pulse was found irregular, and between 90 and 100 in frequency; the cardiac impulse was displaced ½ in. outside the nipple line, and slapping in character; a systolic murmur was present at the apex, and the pulmonary second sound was markedly accentuated; the patient complained of pain and weakness in the legs; knee-jerks present. She was put to bed. A nasal voice developed a fortnight later. On 8th December the pulse was between 72 and 90, and quite regular, the murmur had disappeared, and the cardiac impulse was in the nipple line; the knee-jerks were now absent. On 18th December the patient got up again and could walk, but there was marked ataxy of the legs; no other signs of nervous affection were present. On 6th January 1901 she could walk without ataxy, and the heart and pulse were quite normal.

After a consideration of the various forms of heart failure occurring during the different stages of diphtheria, as exemplified by the cases whose records have been described and discussed above, the very great danger to which patients during the whole course of the disease are liable, as a result of acute degeneration of the neuro-muscular mechanism of the heart, is at once apparent. This danger can only be rendered evident by a thorough and systematic examination of the heart and pulse in every case of diphtheria, however mild it may appear to be; and it can be best guarded against by keeping the patient in bed, or at least perfectly free from all excitement and strain, as long as there are any signs of heart failure, as shown by an irregular pulse or the physical signs of cardiac dilatation.

The time at which a primary heart failure is to be feared is during the acute stage of the disease, and the only prevention of this consists in the use of efficient doses of antitoxin at as early a period as possible. After the acute stage has passed, and convalescence has set in, the heart failure is generally secondary, and must be dealt with as mentioned above.

In conclusion, I wish to express my thanks to the physicians of University College Hospital for so kindly allowing me to make use of these cases.

CONTRACTED BLADDER TREATED BY GRADUATED FLUID DILATATION.

By A. W. Mayo Robson, F.R.C.S., *Senior Surgeon to the General Infirmary at Leeds; Emeritus Professor of Surgery in the Yorkshire College; Member of Council R.C.S. of England.*

The following instance is one of a troublesome class of cases which, until the matter was taken up by the late Dr. Matthews Duncan, were considered incurable, and even yet the method of treatment he advocated is not so frequently followed as it perhaps might be.

On 17th January 1890, I received the following letter from a medical friend: "I was consulted yesterday by a single woman, æt. 35, who has suffered for years from complete incontinence of urine. On attempting to pass a sound, I could get it no further than the length of the urethra, when it impinged on a calculus. I was unable to pass the sound round it, the bladder seeming to be firmly contracted over it; therefore I am quite unable to judge whether it is a very large stone or a smaller one impacted near the inner opening of the urethra. My attempts to get round it gave rise to so much pain and some bleeding, that I did not persevere, as she was not under an anæsthetic. It is evidently a case for operation."

The following notes are taken from the Hospital record:—

Case.—A. Q., æt. 35, admitted to the Leeds General Infirmary, 23rd January 1890. She stated that her symptoms started twelve years previously, when she had great pain in the loin and at the neck of the bladder, at the same time; she had to pass water very frequently, the pain and frequency of micturition having persisted. She had occasionally passed small fragments of stone, the largest about the size of a coffee-bean. For seven years she had had nocturnal incontinence of urine, and for two years complete incontinence day and night. During the latter part of the time she had been comparatively free from pain. The urine was horribly offensive, alkaline, and loaded with pus. On 31st January, the patient was etherised and examined bimanually, in order to ascertain the size of the bladder, as the passage of the sound gave very little information, since, immediately on entering the bladder, it was arrested by coming in contact with hard calcareous material. Bimanual examination revealed the fact that the bladder was represented by a small hard lump about the size of a walnut. The ureters were apparently free from disease, and there was no enlargement of the kidneys. The urethra was dilated by a Weiss dilator, so as to admit the little finger, when it was found that the minute cavity was lined by phosphatic concretions, which were thoroughly scraped away by a Volkmann's spoon, the bladder then having a capacity of only half an ounce; and although the patient was under an anæsthetic, no more could be injected by any reasonable amount of force. The incontinence persisted after the operation, and the bladder was washed out daily with boracic lotion, on each occasion the urethra being compressed around the nozzle of the syringe, and moderate force being used in order to increase the vesical capacity. After a few days the incontinence ceased, and the patient was told to hold her urine as long as possible. On 8th February she could hold it for half an hour, and when the bladder was distended with boracic lotion it was found that the capacity had increased to 2 oz. On 26th February considerable improvement had taken place, as she was able to retain her urine for three hours, with some effort, and the quantity she retained was 4 oz. On 7th March she held her urine for four hours; the bladder was again somewhat forcibly distended, but without an anæsthetic; the capacity, however, could not be increased beyond 4 oz., and the next day the patient had pain in the hypogastrium, with vomiting and considerable irritability of the bladder. This decidedly retarded progress, and although on 26th March the capacity of the bladder was found to be still 4 oz., there was very frequent micturition and slight elevation of temperature. Further dilatation was not attempted, as it was thought that, the bladder having now some capacity, voluntary retention of urine would secure gradual dilatation, and by 17th April she was able to retain 7 oz. of urine. Up to this time the patient had been kept recumbent, as it was found that she could hold her urine much better when in bed. At the end of April her general condition was very much better than it had been for years, and the voluntary power of retention was good. On 4th May she was able to hold 7 oz. of urine, even when up and about, and she had not to micturate for five hours. On 24th May she was discharged, as she could hold 8 oz. of urine without discomfort, and as her general health was good and the urine normal.

The progress of the case was most satisfactory, but it might have been quicker if, after some vesical capacity had been obtained, voluntary retention had been more relied on, as the last dilatation retarded the progress of recovery for a time by setting up irritability of the bladder. In order to keep the urine aseptic, while undertaking any operation on the urinary passages, I usually order the patient to take boracic acid or salol internally; in fact, this has become so much a practice with me, that, unless there is some contra-indication, urinary cases admitted for operation are at once ordered 5 grs. of boracic acid and 5 grs. of salol, to be taken in wafer paper thrice daily, and this practice has, I feel sure, done much to abolish post-operative urinary fever. It will be seen that the method pursued is on the principle laid down by the author of the operation, though in details it differed from any of his cases, and in fact every case of this kind must be a law unto itself, for it will be quite possible, by trying to make too much haste, to bring about death rather than recovery. In no class of cases would the motto *Festina lente* hold better than in this.

THE EDELMANN "GALTON-PFEIFE."

By H. MACNAUGHTON JONES, M.D., M.Ch., F.R.C.S.I. & Ed., *Founder, and formerly Surgeon, Eye, Ear, and Throat Hospital, Cork.*

(PLATE V.)

WHEN in Munich, in the month of October last, I attended Professor Bezold's clinic, and had the advantage of seeing him test a number of patients with Professor Dr. von Edelmann's most recent "Galton-Pfeife." No one who has been at that clinic can have failed to have been struck with the pains Professor Bezold takes in the exhaustive examination of his cases, and in nothing more so than in the accurate determination of the hearing of every patient attending at it. This was specially seen in the application of the Galton pipe, to accurately determine the exact tone and number of vibrations per second (in the higher tones) heard, the results being recorded, with the particulars of the case, at each visit. Having now used this Galton pipe myself since my return, it occurred to me that it might be of interest to other otological workers, who have not seen it, to know its construction and use.

The value of the Galton whistle in estimating the perceptive power of the ear for high tones, is well known to every otologist, and it is more especially useful when used side by side with the tuning-fork for the differentiation of simple middle-ear deafness and that arising from some affection of the labyrinth or auditory nerve. To obtain a whistle which would give us certain records of the varying hearing for these higher tones was a matter of the greatest importance for the otologist engaged in estimating the improvement in hearing made by the patient. This could only be done by an accurate and carefully taken record of the hearing power when the patient first came, and retesting from time to time at subsequent visits. It may interest those who have not already used the instrument, to have a short description of Professor Edelmann's most recently constructed Galton pipe, by means of which, and by the aid of Kundt's dust figures, the relative number of vibrations in such high tones is accurately determined, as well as the number of vibrations per second in each.

Up to quite recently the testing of the tones of the Galton whistle was confined to experiments made with each instrument, tried by the hearing of an ear in which the sense was supposed to be perfect. The length of the pipe was reduced to the smallest point of audible vibrations, its mouth also being made as small as practicable. This gave the limit of hearing of the ear at the time it was tested. Below this nothing was heard save the passing of the air through the pipe, the surmise as to the highest tones that the particular whistle was capable of producing being arrived at by a calculation derived from a knowledge of the lowest tone that particular whistle could produce, the length and calibre of the pipe being known. The influence of the distance of the mouthpiece from the pipe in producing the tone was not taken into consideration, and hence the conclusions arrived at as to the higher tones were only approximately correct. It has been clearly proved by Kundt's dust figures that the production of these upper tones varies according to the position of the mouthpiece from the pipe. Thus in the new Galton pipe of Edelmann regular vibrations are only produced when the mouthpiece is distant from the pipe between 1·8 and 3·8 mm.; any further widening of the space preventing the production of clear tone. It records a tone of 54,900 complete vibrations at a length of pipe of 0·2 mm. and 0·6 width of mouth.[1] Pure tones can only be measured if the length of the pipe is not reduced below 8 mm. Melde holds that the perception of high notes depends to an extent upon the strength of the tone, and those of the new pipe are very strong. With it we can prove absolutely that some persons can hear tones of 50,000 or even more vibra-

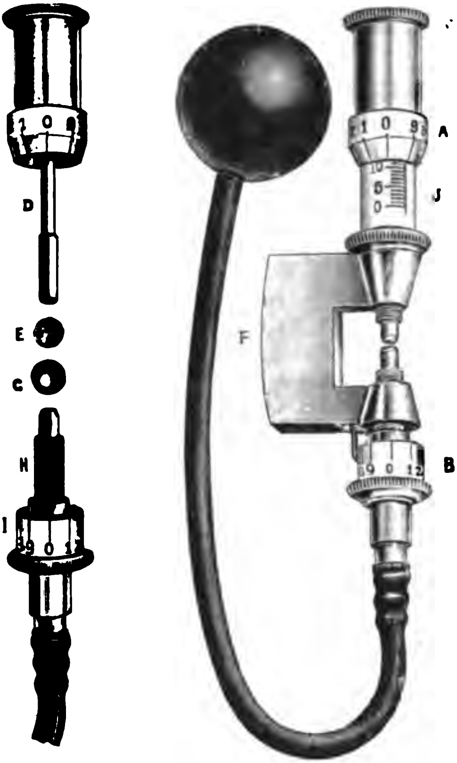

Fig. 1.—Edelmann's Galton pipe (half natural size), No. 446. CAJ, Barrel with lid and scale, regulating the length of the pipe D, in millimetres, from 0 to 25 mm. E, Section of pipe with its piston, showing the circular space surrounding the piston. G, Section of mouthpiece, showing the circular space through which the air is driven through the rubber band by the pipe D. B, Scale, showing in ten equal divisions the degree of rotation of the mouthpiece, thus regulating its distance from the aperture of the pipe. F, Handle to hold the Galton pipe by. H, Screw of mouthpiece.

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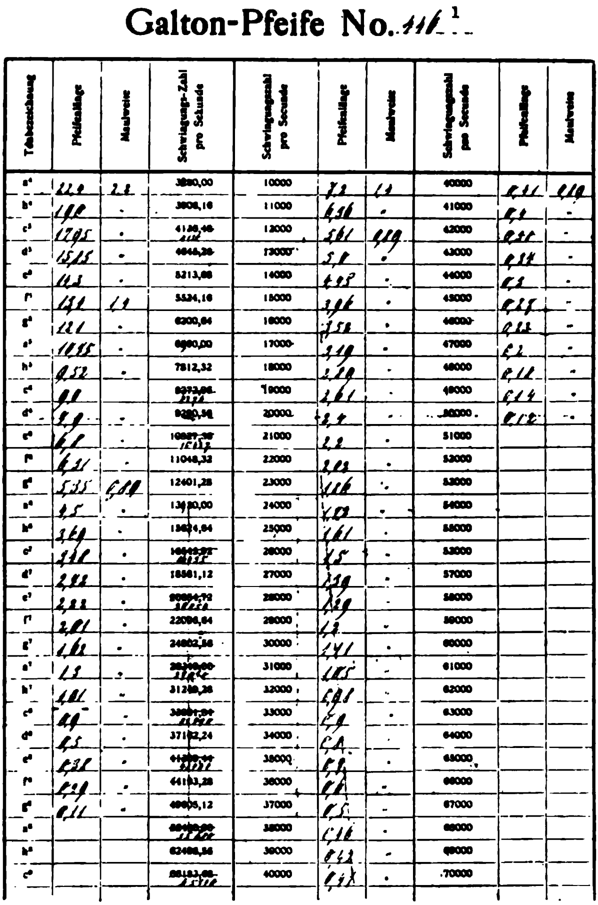
[1] By taking the exact length of a wave with a compass and millimetre measure, and dividing the velocity of sound (at mean temperature) by this, we arrive at the number of vibrations in a given tone—

$$n=\frac{v}{\ }$$

tions. "When we formerly supposed," says Edelmann, "that we had reached the highest audible tones, we were most likely mistaken, as in all probability the pipe did not sound."

It will be seen from Fig. 1 that the "Galton-Pfeife" consists mainly of two parts, with an intermediate strong handle



Galton-Pfeife No. 446[1]

Tonbezeichnung	Pfeifenlänge	Maulweite	Schwingungs-Zahl pro Sekunde	Schwingungszahl pro Secunde	Pfeifenlänge	Maulweite	Schwingungszahl pro Secunde	Pfeifenlänge	Maulweite
a⁴	[illegible]	[illegible]	3480,00	10000	[illegible]	[illegible]	40000	[illegible]	[illegible]
h⁴	[illegible]	.	3906,16	11000	[illegible]	.	41000	[illegible]	-
c⁵	[illegible]	.	4138,46	12000	[illegible]	[illegible]	42000	[illegible]	-
d⁵	[illegible]	.	4645,28	13000	[illegible]	.	43000	[illegible]	-
e⁵	[illegible]	.	5213,88	14000	[illegible]	.	44000	[illegible]	.
f⁵	[illegible]	[illegible]	5524,16	15000	[illegible]	.	45000	[illegible]	-
g⁵	[illegible]	.	6200,64	16000	[illegible]	.	46000	[illegible]	-
a⁵	[illegible]	.	6960,00	17000	[illegible]	.	47000	[illegible]	.
h⁵	[illegible]	.	7812,32	18000	[illegible]	.	48000	[illegible]	.
c⁶	[illegible]		[illegible]	19000	[illegible]	.	49000	[illegible]	.
d⁶	[illegible]	.	9290,56	20000	[illegible]	.	50000	[illegible]	.
e⁶	[illegible]	.	[illegible]	21000	[illegible]	.	51000		
f⁶	[illegible]	.	11048,32	22000	[illegible]	.	52000		
g⁶	[illegible]	[illegible]	12401,28	23000	[illegible]	.	53000		
a⁶	[illegible]	.	13920,00	24000	[illegible]	.	54000		
h⁶	[illegible]	.	15624,64	25000	[illegible]	.	55000		
c⁷	[illegible]	.	[illegible]	26000	[illegible]	.	56000		
d⁷	[illegible]	.	18581,12	27000	[illegible]	.	57000		
e⁷	[illegible]	.	20854,72	28000	[illegible]	-	58000		
f⁷	[illegible]	.	22096,64	29000	[illegible]	.	59000		
g⁷	[illegible]	.	24802,56	30000	[illegible]	.	60000		
a⁷	[illegible]	.	[illegible]	31000	[illegible]	-	61000		
h⁷	[illegible]	.	31249,28	32000	[illegible]	.	62000		
c⁸	[illegible]	-	[illegible]	33000	[illegible]	.	63000		
d⁸	[illegible]	.	37162,24	34000	[illegible]	.	64000		
e⁸	[illegible]	.	[illegible]	35000	[illegible]	.	65000		
f⁸	[illegible]	.	44193,28	36000	[illegible]	-	66000		
g⁸	[illegible]	.	49605,12	37000	[illegible]	-	67000		
a⁸			[illegible]	38000	[illegible]	.	68000		
h⁸			62498,56	39000	[illegible]	-	69000		
c⁹			66183,68	40000	[illegible]	.	70000		

FIG. 2.—Table accompanying No. 446 Galton pipe, giving the tones, the lengths of pipe, widths of mouthpiece, and vibrations per second for each tone. Also the length of pipe and width of mouthpiece required to produce a given number of vibrations per second, from 10,000 to 50,000.

(F) to hold the whistle steadily by. The upper portion is the pipe (D), which is fitted accurately with a piston. This can be readily moved up or down in the pipe by the lid (C), which stops its cylindrical opening (E). The distance of the piston from the lower end of the pipe is marked by a scale (J), most perfectly adjusted, in millimetres, from 0 to 25. The lower part is the mouthpiece, which has an aperture in the form of a ring (G) through which the air passes, and this being brought directly opposite the aperture in the lower end of the pipe, the column of air between the two vibrates. An indiarubber ball is attached to the tube of the mouthpiece, and this being held in the hollow of the hand, by compression of the ball with the tip of the thumb, air is propelled through the pipe, when the tones, varying in height according to the distance of the mouthpiece from the pipe and the position of the piston on the latter, are produced. The drum (B) attached to the mouthpiece has its circumference divided into ten equal parts. By rotation of the drum the length of the mouthpiece is altered, and thus its distance from the body of the pipe can be varied, and the "mouth-width" can be defined in tenths by a turning of the screw. We thus see that we can immediately vary and accurately measure in millimetres the length of the column of air in the pipe, and at the same time regulate the exact distance of the mouthpiece from it. Necessarily, the lower the piston in the pipe and the nearer the mouthpiece, the higher the note and the greater the number of vibrations.

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[1] *Ztschr. f. Ohrenh.*, Wiesbaden, Bd. xxxvi.

Schwendt has made use of Kundt's dust figures to estimate the number of vibrations for each high tone as it is produced by the Galton pipe. These dust figures are produced in the following manner:—A perfectly clean and dry glass tube is closed at one end with a cork, and some dry lycopodium is poured into the pipe, while it is held vertically, and it thus collects at the bottom or closed end of the tube. By now holding the tube in a slightly slanting direction, with the open end downwards, and by tapping it first at right angles, and finally in the direction of the axis of the tube, with a slender stick of wood, such as a pencil, the powder is readily distributed in a long and narrow layer along the tube (Fig. 1, Plate V.). This requires a little practice. The tube is now placed in a horizontal position, and turned slightly, so that the stream of powder lies a little on one side. The mouth of the pipe is now held exactly opposite the aperture of the tube, and when the pipe is sounded the column of air in the tube vibrates. Where the vibrations of

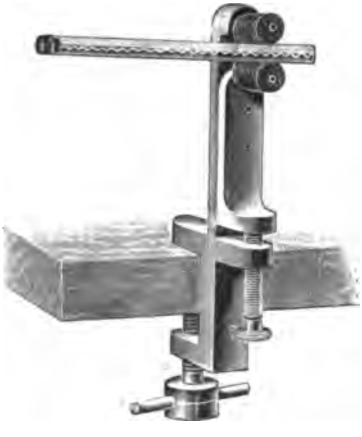

FIG. 3.—Edelmann's vice and clamp for holding the dust tube.

air are the more powerful the powder falls to the greatest distance, but is stationary where the nodes are present. Festoons are thus produced, and these ventral segments form an undulating line. Two of the former constitute a wave (Fig. 2, Plate V.). The number of these waves can then be measured. Any one can carry out this experiment for himself. The festoons, with their ciliated projections, are beautifully seen against the dark ground of a sheet of black cloth or black copying paper.[1]

For measuring the higher tones, shorter and narrower tubes should be used. A stick of sealing-wax, some 5 or 6 in. long, is taken, and the middle of the tube is fixed to this. The lycopodium stream is then distributed, and the lower end of the wax is fixed to a piece of wood or the side of a table. The tone is then taken (Fig. 5, Plate V.). Each time the experiment is repeated, it is better to remove the tube from the table, for redistribution of the powder. Following these simple directions of Schwendt, I have had no trouble in obtaining, in tubes of various sizes, the characteristic dust waves. I have photographed some of these for the purposes of this paper. Fig. 2, Plate V., shows a wave taken with the pipe 22·4 mm. in length, and the mouth width 2·2 mm., representing the tone A^4, 3480·00 vibrations per second. The wave measures nearly 100 mm. Fig. 3, Plate V., shows five waves (ten ventral segments), 11 cms., that is 110 mm., each wave being 22 mm. in length. These waves were produced by a length of pipe 10·75 mm. and a mouth width of 0·89 mm., producing the tone E^6, 6960·00 vibrations per second. Fig. 4, Plate V., shows eight waves (sixteen ventral segments), measuring 12¼ cms., that is 122½ mm., each wave being about 15 mm. in length. These waves were formed by a length of pipe 5·35 mm. and 0·89 of a mouth-width, representing a tone of G^6, 12,401 vibrations per second. Fig. 5, Plate V., shows fourteen waves (twenty-eight ventral segments), measuring 75 mm., each wave being 5·3 mm. These waves were produced by a length of pipe 1·01 mm. and a mouth-width of 0·89. Fig. 6, Plate V., shows waves produced by a length of pipe 0·5 mm. and 0·89 of mouth-width. Ten waves measure over 44 mm., each wave being 4·4 mm., representing a tone of D^8, or 37,162·24 vibrations per second.[2]

I take but a few clinical examples for my purpose. A lady consulted me for deafness of considerable duration, which had been for some time stationary. Physical signs, and the various usual tests with watch, by whispering, and tuning-fork, proved the case to be one originally of middle-ear deafness, associated with stenosis of the Eustachian tubes. Watch not heard on contact. Tuning-fork C (260 vibrations) and C (512 vibrations) were heard by bone-conduction well, and badly by air-conduction (Rinné), the sound ceasing rapidly. By the "Galton-Pfeife" I found that she heard 7812·32 vibrations per second with the right ear, and 6960·00 with the left. Testing her repeatedly, the same result was arrived at. There was no doubt that here there was also cochlear involvement.

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[1] The greatest care must be taken to thoroughly dry the tube, by a sand bath or otherwise. Both ends should then be corked, and dipped in paraffin. The tube should be first cleaned with nitric acid and alcohol. Dried mustard seeds are also useful for this purpose.

[2] In the table, Fig. 1, Plate V., the correct lengths of these waves are given, in accordance with the reduction in the actual size of the tubes.

A lady who had suffered in the past from otitis media, resulting at the time in perforation in one ear which had been for some time closed, responded but imperfectly to the tests of acoumeter, watch, and whispering, hearing the tuning-fork about equally to bone- and air-conduction. There was no Eustachian obstruction or collapse in the right ear, but there was stenosis of the left tube. Her principal symptoms were those associated with rigidity of the membrane and ossicular ankylosis, difficulty of hearing in general conversation, and the necessity for fixing her attention in listening. With her right ear she heard 32,870 vibrations well. In the left ear she heard about 30,000. The labyrinth here was obviously intact.

A gentleman who had been deaf for some years, hearing only loud speech, not hearing the watch on contact with either ear, and the acoumeter only by bone-conduction with the right ear, and at 2 in. distance with the left, gave a marked negative response to Rinné's test. There were clear clinical signs of middle-ear affection. He did not hear the C fork (260 vibrations) by air-conduction with either ear, but heard the fork (512 vibrations) held at the same distance with both ears. Tested with the "Galton-Pfeife," he heard 13,640 vibrations per second with the right ear, and with the left somewhat less. There was here some impairment of the labyrinth as well as the middle-ear affection.

In a case of typical old middle-ear deafness in the left ear, the acoumeter heard only by bone-conduction, the watch not heard on contact; with evidence of gross middle-ear changes, and complete Eustachian obstruction, the hearing for high tones was equal to some 35,000 vibrations per second. There was no evidence of any labyrinthine trouble. In the right ear the hearing was normal.

An officer holding an important command in South Africa was struck in his tent by lightning, which rendered him unconscious. Besides other effects at the time, there was a red spot on the mastoid, and the hair over the ear was burnt off. Two fairly large perforations resulted—one in the posterior segment of the membrane, the other below Shrapnell's membrane. Periodical tinnitus followed, and still occurs. Hearing has been fairly restored, as he now hears a whisper in the affected ear, and, as measured by the pipe, some 12,000 vibrations per second. With his good

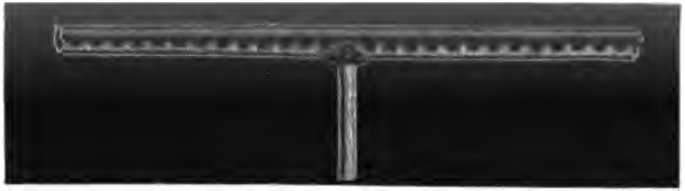

Fig. 5.

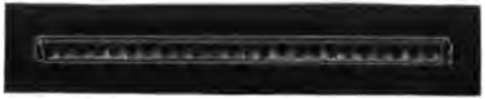

Fig. 6.

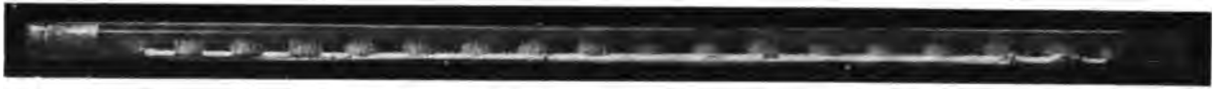

Fig. 4.

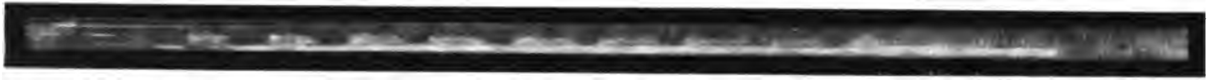

Fig. 3.

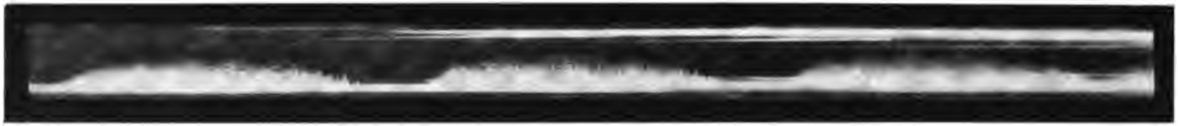

Fig. 2.

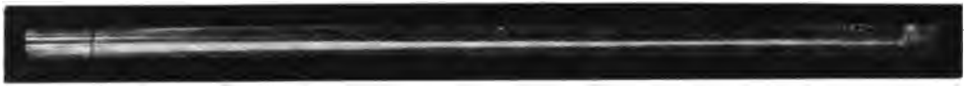

Fig. 1.

Fig. 1.—Layer of Lycopodium in tube.
Fig. 2.—Tube (nat. size) dust waves from length of pipe 22·4 mm.; mouth width 2·2; vibration per second 3,480·00; tone A^4.
Fig. 3.—Tube (reduced ½) ,, ,, ,, 10·75 ,, ,, 0·89 ,, ,, 6,960·00; tone E^6.
Fig. 4.—Tube ,, ,, ,, ,, 5·35 ,, ,, 0·89 ,, ,, 12,401·28; tone G^6.
Fig. 5.—Tube ,, ,, ,, ,, 1·01 ,, ,, 0·89 ,, ,, 31,249·28; tone H^7.
Fig. 6.—Tube ,, ,, ,, ,, 0·5 ,, ,, 0·89 ,, ,, 37,162·24; tone D^8.

Approximately the length of the respective waves in these figures is nearly, Fig. 2 = 100 mm.; Fig. 3 = 45 mm.; Fig. 4 = 29 mm.; Fig. 5 = 10·6 mm.; Fig. 6 = 8·8 mm. The slight inaccuracies in the length of the waves in the figures are due to their being produced from photographs. Figs. 5 and 6 are engravings from photographs, as it was found difficult to get the waves directly done from the negatives. Long exposure was necessitated in consequence of the defective light.

ear he hears about 35,000 vibrations per second. The auditory nerve was here probably affected by the injury.[1]

In a typical case of old apoplectiform labyrinthic seizure, with all the associated symptoms, from which the patient has now in great measure recovered, the hearing in the left ear being normal, the watch being heard on contact only with the right and bone-conduction far exceeding aerial with tuning-forks, the whistle recorded some 36,000 vibrations per second in the normal ear, and some 10,500 in the affected ear.

Having examined the hearing of a number of persons with assumed normal hearing, I have found that a small proportion can reach from 45,000 to 50,000 vibrations per second, and a very large number from 37,000 to over 40,000. I have to thank Professor Edelmann for the use of a second pipe for experimental purposes.[2] Each pipe is numbered as it is issued from the Physico-Mechanical Institute of Professor Edelmann, and accompanying it is a table (Fig. 2) giving all the measurements for length of pipe and mouth-width for the higher tones, and the corresponding number of vibrations per second. A second column gives the length of pipe and the mouth-width for vibrations per second, from 1000 to 5000. The table figured is that of the "Galton-Pfeife" No. 446, the one I have been using.

SOME OBSERVATIONS ON THE PATHOGENY AND TREATMENT OF PES CAVUS, ETC.

By J. JACKSON CLARKE, M.B. (Lond.), F.R.C.S., *Senior Surgeon to Out-patients at the North-West London Hospital; Surgeon to Out-patients at the City of London Orthopædic Hospital.*

PES CAVUS is a condition marked by an increased hollowing of the foot. Many different terms have been applied to it, but that given above is the one used generally. If any change were made it would perhaps be desirable to term it "Talipes Cavus," and so bring its name into closer affinity with the other common deformities of the foot and ankle. Talipes cavus arises from a great variety of causes, the chief of which appear in the following list:—(1) Congenital talipes cavus:—an increased arching of the foot without any other pathological change. (2) As an element in congenital talipes equino-varus. (3) Secondary to talipes equinus or equino-varus, due to infantile paralysis. (4) Secondary to paralytic talipes calcaneus. (5) Secondary to talipes equinus from spastic paralysis, Friedreich's disease and other nerve affections. (6) As part of a contracture of the ankle and foot due to gouty tendencies. (7) From traumatic or ischæmic changes in the soft tissues of the sole.

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[1] Since the above was written, the hearing has much improved, and the tinnitus almost disappeared.

[2] The "Galton-Pfeife" can be obtained through the agency of Messrs. Arnold & Sons, West Smithfield.

It will be seen that there is great variety in the mode of origin of the deformity; and, indeed, a good many points in its pathogeny still require elucidation. The purpose of this paper, however, is rather to give examples of the mode of treatment than to dwell primarily upon the causes, except as they apply directly to the treatment.

The group of cases that comes under the sixth heading are among the most interesting. They are independent of any paralysis. As a rule, the beginning of the deformity appears during adolescence, and it is frequently associated with scoliosis, hammer-toes, etc. The patients have usually a gouty parentage, and they have inadequate digestive powers, and very often they are the subjects of naso-pharyngeal trouble—adenoids, etc.

The earliest indication of commencing deformity in such cases is, that the patient has a habit of holding the foot in the posture of talipes equinus with retracted toes. At first the ankle can be dorsal-flexed to the normal extent,[1] either by the patient's voluntary effort or by passive force, when the patient's knee is kept extended. A little later the patient's voluntary effort is insufficient to thus completely dorsal-flex the ankle, a certain amount of force being required; and when the foot is thus held the patient feels some pain at the femoral attachments of the gastrocnemii. At the next stage there is the typical right-angled contraction of the ankle; later, the degree of equinus and clawing of the toes becomes more and more marked, and the degree of cavus progresses proportionally, and becomes fixed, *i.e.*, ceases to be able to be corrected by passive force. The degree of pain and crippling in adult life that is due to this kind of deformity is hard to be realised by those who are unfamiliar with the condition. Painful corns appear on the toes, and under the ball of the great toe; and in many cases the patient ceases to be able to walk for more than a few steps. By exercise and proper instrumental treatment, this type of deformity can, in its earlier stages, be cured without operation. The extensor muscles of the toes should be exercised twice daily, and the foot kept at a right angle with the leg by a light night-shoe. In the later stages, operative measures similar to those described below are required.

With regard to the paralytic cases in which talipes cavus forms an element in the deformity, it is remarkable that paralysis either of the extensor or of the flexor muscles may produce cavus. In paralysis of the extensor longus digitorum, the forepart of the foot bends at the transverse joint, owing to the unopposed action of the long and short flexor muscles; in other words, the cavus is part of a general plantar flexion. In talipes calcaneus, the more distal tarsal bones fail to follow the movement of dorsal flexion at the ankle, owing partly to the action of gravity and partly to the traction of the deeper flexor muscles.

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[1] In complete dorsal flexion the plane of the sole of the foot should make an angle of 22° with the axis of the tibia.

In Friedreich's disease, though none of the muscles are completely paralysed when the deformity begins, a condition of pronounced talipes equinus is gradually produced. The first change is a slight drop of the foot, which is easily corrected by a suitable instrument.

Treatment.—As an instance of the general plan of treatment to be adopted in these cases, I may refer to the case of a boy, æt. 9 years, whom I recently showed before the Harveian Society. The patient was sent to me by my colleague, Dr. Harry Campbell, and he had typical symptoms of Friedreich's disease. His mother said that he had never walked well, and latterly he had been unable to walk at all. The appearance of the feet, in their best possible position before treatment, was as is shown in Fig. 1; after six weeks of operative and manipulative treatment, as shown in Fig. 2. In cases of talipes equino-varus with clawed toes and cavus, it is important to do all that is to be done to the toes and the cavus at a first operation, and to leave the division of the tibialis tendons for some weeks later. In this case, the plantar fascia and the short plantar muscles were divided subcutaneously at the first operation, and a malleable splint was applied to the front of each leg and foot, and a metal plate to each sole, and bandaged on. A fortnight later the tendo Achillis, the tendons of the tibialis muscles, were cut subcutaneously above the ankle. The foot was then brought to a right

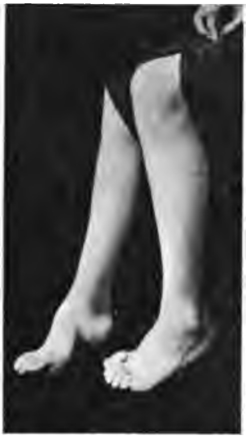

FIG. 1.—Severe talipes equino-varus, with marked pes cavus in Friedreich's disease.

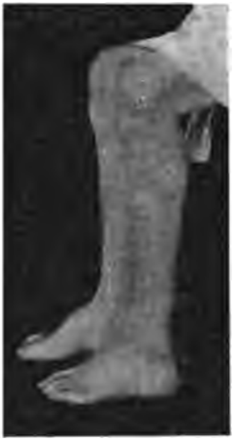

FIG. 2.—Severe talipes equino-varus, with marked pes cavus in Friedreich's disease, after operation.

angle, and the same splint applied as before. At the end of six weeks the patient was allowed to walk, and both his boots were fitted with inside irons that would not allow the ankle to move in the direction of plantar flexion beyond a right angle, and with an instep- as well as a T-strap. This patient can now walk about in comfort.

When they are in a condition of hammer-toe, more or fewer of the toes may require to be straightened, either by subcutaneous or by open operation, and afterwards sole-plates, with slots for the passage of a band of soft cloth to form loops for the toes, is required—an ankle-strap to keep down the heel and an instep-strap to diminish the cavus being added, as shown in Fig. 4.

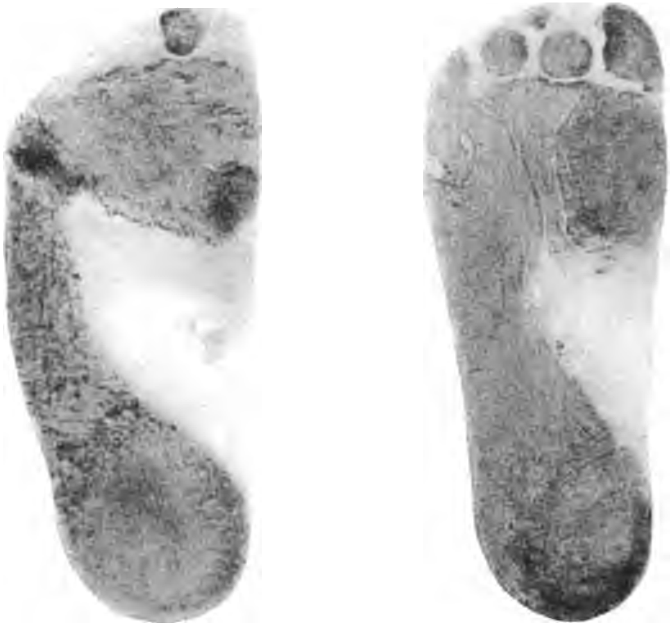

FIG. 3.—Footprint in the same case, before and after operation, to show how the foot has been unfolded.

In paralytic cases, tendon transplantation should be employed whenever there is enough sound muscle left to make it worth while.

Thus in talipes calcaneo-valgus the tendo Achillis should be shortened, and the sound peronei tendon implanted into it. The results of the operation are the most satisfactory: the patient regains the power of raising the heel, and all tendency to recurrence of deformity is done away with. Some cases of this kind I have watched for several years after operation.

In cases of gouty contracture, general medical management should be combined with surgical treatment. In such cases, deformity is often accompanied by metatarsalgia, or other painful symptoms, and the final good effects of operation are not reached till all the remnants of the previous painful condition have disappeared. In the common paralytic equino-varus, the fibrous part of the skin, under the head of the first metatarsal bone and the subjacent fat, become thinned, and the nerves are thus unduly exposed to pressure, with much resulting pain. In several cases that have been under my care, this pain has been very severe, radiating from the foot upwards along the whole limb to the top of the thigh. When the patient resumes walking, after operation, some disappointment may be experienced, because pain is still felt. In the course of time, however, this symptom entirely disappears, if the proper after-treatment is adopted.

The chief point to attend to after operation is to prevent any return of equinus, which, as has been shown above, is the first step in the departure from the normal condition. To this end, the patient must wear by night a light apparatus that prevents plantar flexion, while it encourages dorsal flexion, of the foot; and by day an iron fixed to a strong boot of correct shape, furnished with T- and instep-straps. Regular exercises designed to strengthen the extensor muscles are also of great importance.

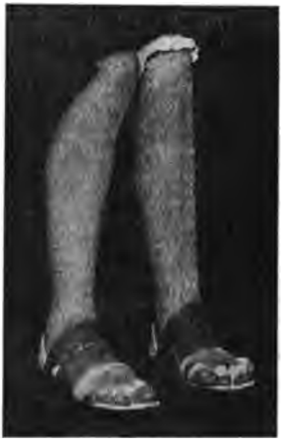

FIG. 4.—Showing sole plates applied to the feet after operations for hammer-toes and pes cavus, etc.

CHYLOUS ASCITES DUE TO PERITONEAL CARCINOMA.

By R. MURRAY LESLIE, M.A., B.Sc., M.B., M.R.C.P., *Senior Medical Registrar, King's College Hospital; Senior Assistant Physician, Royal Hospital for Diseases of the Chest, London.*

OWING to the comparative rarity of chylous ascites, the following case may be of interest as exemplifying what is probably one of the most common types of this interesting condition:—

CASE.—The patient was a woman, æt. 52, who was under my care during the early part of 1901. She had apparently been quite healthy until about four months before coming under observation. At that time she began to be troubled with sickness after meals, a symptom which increased in frequency and severity up to the day of admission.

She acknowledged having at one time indulged somewhat too freely in alcoholic liquors; she had had no previous illness of any importance, but stated that she had frequently suffered from hæmorrhoids.

The patient was found to be a fairly well-nourished woman, and had passed the period of the menopause. The tongue was dry and furred, the bowels constipated, and hæmorrhoids were present. The circulatory and respiratory systems were normal. The urine was diminished in amount, acid in reaction, with a specific gravity of 1020, and contained no albumin. The temperature was subnormal, and remained so throughout the disease.

The abdomen was markedly distended, with distinct bulging of the flanks; there was a well marked "transmitted thrill," and all the usual signs of ascites. The liver was found enlarged, and could be felt by "dipping"; its lower border could not, however, be accurately defined, owing to the ascites. A provisional diagnosis of hepatic cirrhosis was made, and aperients and diuretics were administered, with, however, no resulting diminution of the ascites. Ten days after admission, the circumferential measurement of the abdomen had increased by about an inch, the maximum girth being 44 in. There was now a good deal of dyspnœa, and it was decided to perform paracentesis: the fluid was drawn off, and instead of being serous, as was expected, was found to be quite *milky*. Seven and a half pints of this fluid were withdrawn by means of Southey's tube. Microscopical examination of the fluid revealed the presence of numerous fat globules, with just a few leucocytes; specific gravity was 1020; it contained albumin, and was faintly alkaline in reaction. A report from the Jenner Institute of Preventive Medicine on the ascitic fluid stated that it contained 7 parts per 1000 of fat. The day following the removal of the fluid the patient felt much relieved, the circumferential measurement having been reduced to 42 in. For a fortnight after the aspiration the patient remained very much *in statu quo*. She then became distinctly weaker, the pulse feeble, and she was now unable to take solid food. The abdomen was again becoming much distended, and the quantity of urine passed *per diem* steadily diminished, in spite of the administration of cardiac tonics and eliminants.

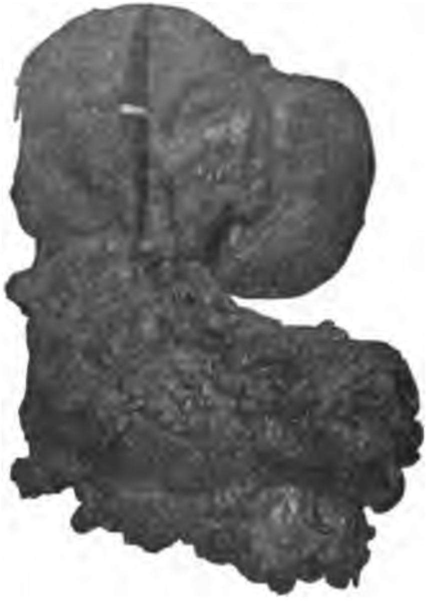

FIG. 1.

An examination was now made *per rectum* and *per vaginam*, but nothing abnormal was found, and the reproductive organs appeared quite free from disease. The patient rapidly became worse, the radial pulse being scarcely perceptible. The left leg now became swollen and œdematous, and the patient was much troubled with nausea and flatulence. Recourse was again had to paracentesis, and more than ten pints of the same milky fluid were withdrawn. On palpating the abdomen after the removal of this fluid, a hard, flattened, scone-shaped mass could now be distinctly felt, occupying the central part of the abdomen; it was movable from side to side, but was little affected by respiratory movements. It had a sharp, rounded, clearly-defined edge, and the mass was believed to be connected with the great omentum. The abdomen again became distended. A week after the second aspiration a slight degree of jaundice was observed for the first time.

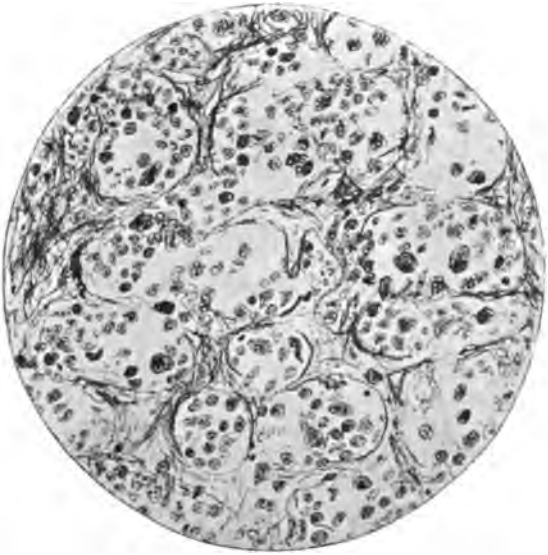

FIG. 2.

The conjunctivæ had a yellow, icteric tinge, the urine contained bile pigment, and the fæces were drab-coloured. A few days later the patient was seen to be evidently sinking: the jaundice had become more pronounced, the pulse was imperceptible at the wrists, and even liquid nourishment could not now be tolerated. There was constant and distressing vomiting of dark, bile-stained fluid, and the patient gradually succumbed from exhaustion and cardiac failure, six weeks after coming under observation.

The post-mortem examination revealed a large carcinomatous mass involving the whole of the omentum and infiltrating the greater portion of the mesentery, and extending between the coils of the intestine, which were inextricably matted together; the mesenteric glands were also enlarged. The abdomen was full of bile-stained milky fluid. The malignant mass in the omentum was closely adherent to the right lobe of the liver, where it was continuous with a rounded carcinomatous growth just to the right of the portal fissure and involving the gall bladder (*vide* Fig. 1); the rest of the liver was healthy, there being no secondary nodules. The stomach and intestines were quite free from malignant disease. Microscopical examination of the growth showed it to be scirrhous carcinoma, consisting of dense strands of fibrous tissue enclosing rounded spaces filled with spheroidal cancer cells (*vide* Fig. 2). The thoracic duct was, with great difficulty, dissected out. It appeared to be normal, patent throughout, and there was no sign of rupture.

In the above case the chylous ascites was in all probability due not to the obstruction of the thoracic duct, but to the blocking of the smaller lacteals close to the mesenteric attachment of the bowel by the infiltrating growth. In fact, study of the recorded cases would seem to indicate that actual obstruction of the thoracic duct as a cause of chylous ascites is extremely rare. It is, on the other hand, quite conceivable that the smaller lacteals may be readily compressed, either by small malignant nodules in the mesentery, or by any of the forms of chronic adhesive peritonitis, tuberculous or otherwise, by which the lacteals can be obstructed as they leave the intestine. In the case under consideration, it is possible that the compression of the root of the mesentery by the carcinomatous mesenteric glands may also have been a causal factor.

As bearing on the above case, it may be noted that the Italian physician Ceconi[1] published an article dealing with milky effusions into the peritoneal cavity. He divided them into four classes—

1. *Chylous*, where *true chyle* is found in the peritoneal cavity, due to rupture of the chyle ducts and lymphatics, in most cases the result of external injury or of pressure on the ducts by malignant glands or other tumours.
2. *Chyliform*, where the milkiness is not due to actual chyle, but to *fatty degeneration of cells*, and generally the result of malignant disease of the serous membrane.
3. *Combination of chylous and chyliform.*
4. *Effusions*, where the milkiness is due not to fat at all, of which there is very little, but to *albuminoid substances* probably derived from the blood serum.

Ceconi states that the chylous and chyliform varieties cannot be distinguished by microscopical or chemical examination of the fluid, but can be readily distinguished by observing the effects of a diet rich in fatty constituents. In the chylous form the ascitic fluid removed after such a diet shows a marked increase in fats; while in the chyliform variety there is no such change. This dietetic test was not applied in the particular case above described.

I am indebted to my friend Dr. G. N. Meachen for the photograph and drawing from which the figures were prepared.

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[1] *Gaz. d. Osp.*, Milano, September, 1898.

CLINICAL RECORDS.

NOTES OF TWO CASES OF LARYNGEAL DIPHTHERIA IN THE ADULT; TRACHEOTOMY.

By CHARLES PORTER, M.B., B.SC., *Physician Superintendent, Lightburn Hospital, Shettleston.*

LARYNGEAL diphtheria in the adult, with obstruction of such intensity as to call for tracheotomy, is so rare at any time, that the occurrence of two cases within the space of three weeks seems interesting enough to make it worth while recording them.

The ordinary text-books, so far as I can find, make no mention of the condition, nor does Lennox Browne in his essay.[1] In an analysis of 2093 cases by Burrows,[2] laryngeal involvement was found in 337 instances, but the ages of the patients are not stated. The same may be said of the 1778 cases reported by Richardiere.[3]

Of 114 cases of diphtheria admitted to Leith Public Health Hospital, between June 22, 1900, and April 1, 1901, the larynx was found to be affected in twenty-seven, three of the patients being over 20 years of age. In one case the symptoms were slight, and soon disappeared after the injection of antitoxin; in the remaining two, obstruction was marked, and called for tracheotomy. The notes of these two cases are given below.

CASE 1 was notified at the Leith Public Health Office as "Membranous Croup" (?), the doctor stating that, though he could not be absolutely certain, the symptoms were so suggestive that, even though the patient was a man of 38, he hesitated to send the case to other than a fever hospital.

The history obtained from the patient was, that he had been perfectly well till four days previously, when he noticed that he was a little breathless and that his voice was rather hoarse. This soon passed off, and he paid no further attention to it. Three days before admission, lying down after his return from work, he again experienced some slight difficulty of breathing; this, however, lasted no time, and did not return till the next night after he had gone to bed. The following morning, the day before admission, he went out as usual and did a good day's work, but when he got into bed at night the attacks began again, and recurred at intervals till he was brought into hospital.

So far as he knew, there was no diphtheria in the stair, and certainly none of the people in the house with him had a sore throat, or anything resembling diphtheria.

On admission, he was rather restless and excited, and complained of pain when he swallowed or coughed. Examination showed him to be a strong, muscular man. The facial expression was a little anxious, but the colour was good, and he seemed to get plenty of air with each inspiration. The voice was husky, the fauces were red and congested, the tonsils slightly enlarged, but nowhere was there any membrane. The glands at the angle of the jaw were not enlarged. The extraordinary muscles of inspiration were not acting. The pulse was a little rapid, but otherwise good. There was no difference between the two radials, and the pupils were equal. Examination of the heart, lungs, etc., revealed nothing.

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[1] "Diphtheria and its Associates."

[2] *Brit. Med. Journ.*, London (Epitome), March 23, 1901.

[3] *Public Health*, April 1901.

As soon as possible he was put into a steam tent, and in addition 8000 units antitoxin were injected. After this he quietened for a time, but soon one of his "breathless" attacks came on, lasted a few seconds, and then passed off, to be followed by a fit of coughing. During the attack it seemed as if the glottis had closed, and that air could not get through. Coughing seemed to give him no relief, and only resulted in his bringing up a small quantity of mucus. After ten or fifteen minutes he had another similar attack, and these continued to recur at intervals.

Still being uncertain as to the cause of the dyspnœa, and considering the possibility of a foreign body in the larynx, I asked Dr. Logan Turner to come and see the case. Shortly after his arrival the man had another severe attack, but this, like the others, wore off, and an attempt to examine the larynx was made. This was found exceedingly difficult, as the slightest interference brought on the difficulty in inspiration, and all that could be made out in the glimpse obtained was that the epiglottis was red and congested, but, like the parts above, free from membrane.

As the man was getting worse, tracheotomy was determined upon; but before he could be got on to the table another spasm occurred, his face got livid, and pulse and respiration almost ceased. Fortunately there was a knife at hand, and Dr. Turner cut down and opened the trachea. After a fit of coughing, during which a small piece of membrane was expelled, the colour and pulse improved, and when a hypodermic of ether had been given he was able to lie down.

Films from the piece of expelled membrane showed, as is so frequently the case, cocci only.

After the tracheotomy tube had been introduced, the patient expressed himself as feeling comfortable. The temperature was 102° F., the pulse 126, and the respirations 36 per minute. The cough was frequent, but the mucus was easily expelled. All night he did not sleep, but was perfectly comfortable. Towards morning, however, the bronchial secretion coughed through the tube, at first copious, began to diminish in quantity, and finally almost entirely disappeared. The expired air had a very foul smell, so the tracheotomy tube was removed, and replaced by one of a larger size, but without benefit.

As the morning went on he became very excited; the respirations increased in frequency and whistled drily through the tube; he persistently tried to get out of bed, and finally had to be strapped down. Chloral and bromide failing to quieten him, $\frac{1}{100}$ gr. hyoscyine was administered, and kept him at rest for a few hours. About midday the temperature began to go up, and, despite sponging, remained about 105° and 106° F.; the pulse and respirations increased in frequency, and ultimately, about 6·30 P.M., he died, the thermometer just before death indicating 107° F.

Permission for a full post-mortem examination could not be obtained, but we were allowed to extend the incision and examine the larynx. The following notes were made by Dr. Logan Turner:—

"Epiglottis swollen and œdematous, the œdema involving the ary-epiglottic folds and arytenoid region. The glottic chink was not visible from above. A piece of thick diphtheritic membrane, measuring 1 in. by ½ in., was attached to the left epiglottic fold. The whole mucus surface of the larynx, from the tip of the epiglottis to the cricoid cartilage, was covered with a soft friable membrane, and the interior of the larynx contained a small quantity of pus. Owing to the inflammatory changes present, the false and true cords and the ventricle were indistinguishable. There were no enlarged cervical glands."

Films made from pieces of the membrane found, and from a swab taken from the raw surface beneath it, showed Klebs-Löffler bacilli and streptococci.

A few days after his death the patient's daughter was admitted to hospital suffering from diphtheria.

Case 2.—M. B., a nurse in Pilton Hospital. She began work in the house two weeks before she turned ill, and, with the exception of two hours spent in the diphtheria wards on the day she arrived, had been on day duty in the Scarlet block.

The first thing she noticed was a sore throat on March 10, but it was very slight, and she did not report anything wrong till the morning of the 11th, when she complained that she had caught a cold and lost her voice. The throat was a little red, but clean. She had a slight cough, and the voice was rather husky; for this she was given a cough mixture and told to inhale tinct. benzoin. co., and went on duty. Next morning she went to her ward as usual, but about 10 o'clock had to leave off work, on account of a feeling of chokiness. After going to bed she felt fairly comfortable, coughing a little croupily at times, but otherwise quite well. As night came on she began to have attacks of breathlessness, so that, as in the former case, she was given 8000 units of antitoxin, and put in a steam tent. The steam seemed to relieve her somewhat, but in the early hours of the morning she became very restless and very croupy, and at 5 A.M. on March 13, tracheotomy was performed by Dr. Robertson, the medical superintendent.

After the trachea was opened there was little or no relief, but, after feathering, two long pieces of membrane were expelled, and the breathing became quieter. A large-sized tracheotomy tube was introduced, and the patient put back to bed, where she seemed fairly comfortable. After about half an hour she began to get restless again, complained of chokiness, and as there was evidently membrane flapping against the end of the tube, feathering was resorted to. This was without avail, and the outer tube had to be removed; this gave relief, but any attempt to replace it brought on the discomfort anew. Another 4000 units of antitoxin were administered, the tube left out, and the tracheal incision kept open by means of dilators.

About noon more membrane was expelled, and, as she felt better, the tube was re-introduced. Temperature at this time was 100° F., the pulse 110, and the respirations 20 per minute.

For the remainder of the day and night till 10 P.M. she did fairly well; at times there were attacks of dyspnœa, but not so intense as formerly. At this time, however, the bronchial secretion showed signs of drying up, the cough became frequent, painful, and ineffectual, and she again complained of feeling choked. The tube was removed, but the breathing was still unpleasantly whistling and dry, and the patient began to get very excited, rolling her head from side to side, and throwing her arms about. Pulse and colour remained fairly good.

Bromidia was given, but without effect, and at last, as morphia was more or less contra-indicated, $\frac{1}{15}$ gr. apomorphine was injected, with the hope of obtaining the sedative effect said to be produced by small doses of the drug. The effect was almost immediate, but not reassuring, for she became very sick, the colour and pulse got bad, and she looked like collapsing. In a little, however, she rallied, and after spraying into the trachea a solution of sod. bicarb., 15 gr. to the ounce of boiled water, some dried-up mucus was got rid of, and she looked better.

This improvement continued only a short time, the restlessness and dyspnœa recurring at intervals. Injections of ether and inhalations of amyl nitrite seemed to give a certain amount of temporary relief, but at 7·30 A.M. she had another bad spasm. After she had coughed up a few plugs of mucus, however, she began to look better, and brightened up in the most remarkable manner.

After having 2 drms. of bromidia and half an ounce of whisky, she dropped off to sleep, and slept for several hours. Later in the day she had a severe fit of coughing, and expelled a long piece of membrane, films from which showed numerous cocci and here and there a few Löffler bacilli.

For two days she continued to cough up pieces of thinned membrane, and on the sixth morning after the operation the tube was removed.

Thereafter she continued to improve, and, after having been about five weeks in hospital, was discharged well. Some days afterwards, however, I am sorry to say, she died. The exact cause of death I cannot give, but am informed that "an abscess formed in the windpipe, and she died while being operated on."

A point which is well brought out in this, as well as in the first case, is the length of time which elapsed before the dyspnœa became really urgent. This is accounted for, as Dr. Gee points out in his article on diphtheritic croup in Allbutt's "System," by the greater width of the glottis in the adult as compared with that of the child.

This delay must tend to make the prognosis more grave even than it is in younger patients, by allowing the bacilli and their products more time to act, though the amount of strength which the adult has to come and go on must be of service when treatment is once begun.

In conclusion, I should like to thank Dr. Logan Turner for the help he so willingly gave me in the first case. To Dr. Robertson, the Medical Officer of Health for Leith, my thanks are also due for his permission to publish these notes.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

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RECENT TEXT-BOOKS OF MEDICINE.

1. *Practice of Medicine, a Text-Book for Practitioners aud Students, with special reference to Diagnosis and Treatment.* By JAMES TYSON, M.D., Professor of Medicine in the University of Pennsylvania, etc. Second Edition. London: Rebman, Ltd. 1901.
2. *The Theory and Practice of Medicine.* By HENRY WALTER SYERS, M.A., M.D., etc. Vol. I. London: Rebman, Ltd. 1901.
3. *Modern Medicine.* By JULIUS L. SALINGER, M.A., and FREDERICK J. KALTEYER, M.D. London: W. B. Saunders & Co. 1900.
4. *A Manual of the Practice of Medicine.* By FREDERICK TAYLOR, M.D., F.R.C.P., etc. Sixth Edition. London: J. & A. Churchill. 1901.
5. *A Manual of Medicine.* Edited by W. H. ALLCHIN, M.D. (Lond.), F.R.C.P., F.R.S.E., etc. Vol. III. "Diseases of the Nervous System." London: Macmillan & Co., Ltd. 1901.

HAD Solomon lived in these days, and made himself acquaint, as was his wont, with all accessible branches of knowledge, he would probably have corrected, in proof, a part of his text. Thus, *for* "of books" *read* "of text-books there is no end"; while, if he had had to peruse many such works, his vocabulary had been still more vehement, and the greater, had he attempted to reconcile their several sayings, and to determine what were facts, not fancies.

The five volumes catalogued above are all of Anglo-Saxon origin (no trace of Cymric or Gaelic adorns their authors' names),—two from "over the pond," three from this side the Atlantic. The patronymics appertaining to the conjoint authors of No. 3 are rather Saxo-Anglican than Anglo-Saxon in sound, but nevertheless the work of the Teuton represents but a small item.

Dr. Taylor's "Manual" having attained to a sixth edition, by reason of the widely recognised merits of its five forerunners, hardly needs any further notice than the calling of attention to the fact of this appearance of a new edition. The text has been carefully revised, in part rewritten; malaria, plague, encephalitis, leuchæmia (so spelt !), and the diseases of the blood have especially been rewritten. Several new diseases and lesions, with several most terrible polysyllabic names, have been included for the first time. Why is it that all the more recently discovered complaints have to suffer from such dissonant names? One of the changes made in this edition consists in the transference of acute rheumatism and gonorrhœal synovitis from the section dealing with joint diseases to that of infectious diseases. Under the headings of Ætiology and Pathology of the first disease, however, no adequate reason is advanced in support of this change of classification; the nature of the malady, in fact, is really left an open question. Dr. Taylor's work constitutes one of the most trustworthy medical guides of to-day.

The text-book of Dr. Tyson well deserved to reach a second edition. Across the Atlantic it is one of the most popular and widely read works of the kind, both by students and by graduates (this on good authority). The sections upon infectious diseases (including again acute rheumatism without much display of etiological assurance), and diseases of the blood are especially good, and will repay careful study.

To the third volume of Dr. Allchin's "Manual of Medicine" several well-known specialists in nervous diseases contribute. The editor writes on headache and trophoneuroses, Bertram Abrahams on electricity as applied in diseases of the nervous system, J. A. Ormerod on spinal lesions, C. S. Sherrington on nerve anatomy and physiology, W. A. Turner on the pathological neurone and organic brain diseases, J. Taylor on ophthalmological questions, etc. Several of the sections undoubtedly give evidence of hasty writing; the facts presented are not in any way at fault—but Lindley Murray assuredly would have been pained had he had to parse some of the sentences employed in their expression. It were invidious to cull samples in support of the foregoing statement from the pages of the "Manual"; one example, however, may be quoted, after divesting it of local colour: "Although the quality . . . is . . . a more frequent cause of disease than are alterations in quantity, yet the latter is . . ." A readily explicable error, yet an ungrammatical confusion, and an error repeated in very similar form elsewhere. It is somewhat amusing to find inefficiency of the centre for syntax in experts on nervous complaints and nervous lesions, especially when their cerebral centres for arithmetic fail to perceive that one is singularly singular, two or more, plural.

It is difficult to know exactly what to say regarding Dr. Syers' "Theory and Practice of Medicine," vol. i.; for what there is, one may account as good; but what there is not, as grievous. The author's judgment, as expressed in his preface, to have little to do with "long disquisitions on morbid anatomy," that analyses of rival pathological theories, minute directions as to "drug treatment," have much to do with their practical value to the student and physician afforded by text-books on medicine, is faithfully acted up to throughout the volume—manifestly to the benefit of the reader, so far as the understanding of the facts afforded goes; but, in striving to avoid all supposedly superfluous details, it is to be feared that the author has chosen such short cuts, that many points of the greatest importance, apart from the matters alluded to above, have been passed by entirely. One of the most valuable, but as rare, attributes of good text-books on medicine consists in the correlation of all the attributes and factors—causal, clinical, and organic—exhibited by, or traceable to, one organ, with all those which are due to other organs, and of demonstrating the connections between all of these.

It is truly instructive to collate the differences of opinion as to one or other point, whether of great or slight importance, exhibited by different text-book writers. For instance, take acute rheumatism and gonorrhœal *synovitis vel arthritis.*

Taylor and Tyson place both under infectious diseases; Salinger and Kalteyer regard the first disease as one of the infectious class, the second they classify among constitutional diseases; while Syers includes neither in his list of infectious disorders, the actual category to which they are to be assigned meanwhile remaining uncertain until his vol. ii. appears.

Again, taking exophthalmic goitre, Syers introduces his description of this disease in the section devoted to circulatory affections; Salinger and Kalteyer discuss it in their chapter upon diseases of the blood and of the ductless glands; so Tyson and Taylor. Gastroptosis and enteroptosis obtain no recognition from Syers; Taylor only mentions the latter; Salinger and Kalteyer dwell upon both lesions somewhat fully; Tyson emphatically. Still further, Syers omits all allusion to dilatation of the stomach, as a clinical entity.

Paroxysmal hæmoglobinuria comes under diseases of the blood in Taylor's work; of the nervous system in Allchin; of the urinary, in Tyson and Syers; and is to seek in Salinger and Kalteyer. The hæmoglobin in the urine in this condition is oxy- alone in Allchin, and along with hæmatin and hæmatoidin crystals, in Syers; frequently along with met-hæmoglobin in Taylor; most commonly met-hæmoglobin, according to Tyson.

It is hard to understand how such discrepancies can arise. A text-book is properly a work purporting to present current medical discoveries and opinions in a form readily understood by the student and practitioner; coloured by personal traits of the author mayhap; but certainly not inclusive of sins either of commission, contrary to commonly received opinions and statements, or of omission regarding very important conditions of no infrequent occurrence, without, in either category, reference to the reasons for the same. The chief fault of text-books—owing to the inability to discuss every authority concerned (for space is an object)—is to be found in the impossibility of the authors introducing what others think, as well as what they think, in adequate detail, or to add all alternative statements or append all cognate references.

Passing from the particular to the general, the second edition of Tyson's work and the sixth re-issue of Taylor's text-book need no further recommendation. The first volume of Syers' "Practice of Medicine" suffers greatly from the author's too strongly emphasised leaning towards that unequal soul of wit, brevity, to detriment of completeness, and to loss of coherence.

The conjoint work of Salinger and Kalteyer can hardly be said to be more than unequal, nor to constitute an infallible guide to those desirous of acquiring a knowledge of the practice of physic, as at present accepted;

for many of the individual opinions expressed upon special subjects are difficult of agreement with views commonly held.

Allchin's volume on "Nervous Diseases" had been — had some of the contributors studied Bacon's "Essays," to learn therefrom the proper moulding of sentences, and also the graces of grammar—most excellent; it fails more in word than in intention; full of fact, it annoys literally.

A. LOCKHART GILLESPIE.

The Accessory Sinuses of the Nose: their Surgical Anatomy, and the Diagnosis and Treatment of their Inflammatory Affections. By A. LOGAN TURNER, M.D., F.R.C.S.Ed. Edinburgh: William Green & Sons. 1901.

DURING the past few years our knowledge of the normal and pathological anatomy of the nasal accessory sinuses has been materially increased by the labours of many enthusiastic rhinologists, both in this country and on the Continent.

In the accompanying volume the author lays before the profession the outcome of a prolonged and conscientious study of the accessory sinuses of the nose, with special reference to their surgical anatomy and to the diagnosis and treatment of their inflammatory affections. The development of the various sinuses, the relation of their ostia to the outer nasal wall, and the more frequent variations met with, are carefully considered. In the author's mind very special interest seems to centre around the frontal sinuses, judging from the minute pains he has devoted to a consideration of their anatomy in European and other races. Many very carefully executed plates depict the numerous variations met with in the size, shape, and diameter of this sinus. The sphenoidal sinus—the sinus with which rhinologists are least of all acquainted — is described with considerable detail, and the author emphasises the value of an intimate knowledge of its anatomy before attempting catheterisation of its ostium or any operative procedure upon its cavity.

Chapter vi. is devoted to a study of the comparative anatomy of the frontal sinuses in human crania, the large number of 578 crania of various races having been examined for this purpose. To the comparative anatomist this chapter will be found interesting and valuable, and the author is to be congratulated upon the great care and assiduity with which he has undertaken this elaborate investigation. To the practical rhinologist and to the operating surgeon the succeeding chapters of the book will probably be found more interesting. Such practical points as transillumination of the sinuses, the diagnosis of sinusitis, and the various methods of treatment are considered in detail. In the diagnosis of diseased conditions of the maxillary antrum, the value of transillumination is fully made out, and its value in assisting the surgeon in arriving at a knowledge of the progress of the case towards recovery is also insisted upon. From a series of very complete experiments, in both healthy and morbid conditions of the frontal sinuses, the author has come to the conclusion that illumination, as a test in the diagnosis of the presence of chronic suppuration within these cavities, is of little or no practical value. In the diagnosis, also, of ethmoidal and sphenoidal suppuration, transillumination is of no value.

"Latent empyema" of the various accessory sinuses comes in for a large share of attention, and the difficulties experienced in diagnosing the sinus or sinuses involved is minutely entered into. The author is unable to give any one symptom which may be relied upon as absolutely diagnostic of frontal sinus empyema, and remarks that "there still remain some cases in which, in the present state of our knowledge, an external opening into the frontal sinus is necessary before an exact diagnosis can be arrived at."

In the treatment of chronic antral suppuration, irrigation through the ostium maxillare is hardly considered, the author holding that it is impracticable for the patient and usually also for the surgeon. An alveolar opening probably forms the most convenient route for treatment by lavage, and where suppuration still persists, after a reasonable trial of various antiseptic lotions, a radical operation upon the sinus should be performed through the canine fossa.

In the treatment of frontal sinusitis, the author prefers the supraorbital incision to the median; he condemns any attempt to enter the sinus intranasally, he looks upon irrigation through the ostium frontale as an imperfect method of treatment, but he strongly advocates the importance of securing free intranasal drainage (by removal of anterior end of middle turbinal, etc.) before resorting to an external operation. He also insists upon the necessity of making a large communication between the sinus and the nose, and discards all drainage tubes, merely packing the cavity, and removing the packing gradually through the inner end of the external incision.

Space does not permit of our mentioning the many other practical details in the treatment of chronic accessory sinus suppuration which are considered and criticised.

The author is to be congratulated upon producing an admirable monograph dealing with this interesting subject, and we strongly recommend it to all rhinologists and surgeons. WM. MILLIGAN.

A Doctor in Khaki. By FRANCIS E. FREMANTLE, M.A., M.B., B.Ch. (Oxon.), M.R.C.P.; late Civil Surgeon to H.M. Forces in South Africa. London: John Murray.

It is a little difficult to classify this book. No doubt it is intended both for the profession and the laity, but every now and then one strikes an allusion which the latter may not understand or fully appreciate. Dr. Fremantle evidently determined to make the most of his year at the front; and what with his powers of observation, his racy diurnal, his capital camera, and his free-and-easy way of writing, he has produced a most entertaining and beautifully illustrated volume. It may not be literature,—indeed, it is flippant in parts,—but it is interesting and true to life. Which of us did not read Stevenson's "Surgery" on the voyage out, and did not find it unsatisfactory? which of us had not our bickerings with the officers of the R.A.M.C., and yet in the end did not come to the conclusion that the system is more to blame than its servants? Dr. Fremantle evidently constituted himself somewhat of a censor, and we fancy proved a thorn in the flesh at Wynberg; but he writes with a good object in view, and is so frank in his criticism, that it loses much of its sting. The book appeals strongly to all old civil surgeons, conjuring up visions of diet sheets and sick returns, troubles with orderlies, and all kinds of surgical and medical cases.

Space does not permit of anything like a lengthy review; but when it is said that Dr. Fremantle gained his experiences in a general hospital, on board an hospital ship, with a field hospital, and when attached to sick convoys and bearer-companies, it will be apparent that his opportunities were great, and he certainly has not wasted them. His conclusions deal with the reorganisation of the R.A.M.C., and contain much sound and useful matter; while a lengthy appendix embodies his medical notes to *Guy's Hospital Gazette*, which were the occasion of his being brought to book early in his South African career.

Though it contains some faults, notably the introduction of personal allusions, the work will be read with much pleasure by all who have served in a medical capacity during the war, even, we venture to think, by the officers of the aforesaid corps, who are not, as a rule, devoid of humour, or inclined to bear malice.

Civil surgeons are still proceeding to the front. It is not too much to say that every one of them should buy and read and digest Dr. Fremantle's book, both previous to embarkation and when they are in the proud position of being in medical charge of troops.

ANDREW BALFOUR.

Therapeutics: its Principles and Practice. By HORATIO C. WOOD, M.D., LL.D. Eleventh Edition. London: Smith, Elder & Co. 1902.

IT is now a quarter of a century since Dr. H. C. Wood published the first edition of his treatise on therapeutics, a work which has been continued in many editions, and which has made his name honourably known in all the medical schools of the civilised world. In America and in Great Britain it was the first book of its kind which dealt fully with the pharmacological actions of remedies; it was written with an exact and extensive knowledge of the literature of the subject, and it achieved an immediate, lasting, and thoroughly deserved success. The successive editions have mostly kept well abreast of all the important advances in pharmacology and therapeutics during this long period; but, owing to the pressure of active occupations and many engagements, Dr. Wood has found it necessary to obtain help in the revision of the present edition, and has accordingly associated his son with himself in its preparation. Advantage has been taken of this to recast the plan of the book in certain respects, and to subject it to a more thorough revision than it has ever yet received. The references to authorities have been taken out of the text and placed at the end of each section, small type has been freely used for the discussion of minor points, and summaries of the author's views regarding the pharmacological action of important drugs have been introduced after the description of each. All these changes constitute very distinct improvements. The summaries just mentioned call for special commendation, on account of their clearness and conciseness, and their preparation must have involved a great deal of careful consideration. The classification and arrangement of the drugs is still a weak feature in the book. It is mainly based on therapeutical considerations, but even this principle is not systematically carried out. For instance, we find cocaine, eucaine, and atropine classed together as "delirifacients"; tannic acid, copper salts, and bismuth salts in the "family" of astringents, under an "order" denominated "nutriants"; while tartaric and citric acids figure along with arnica, hydrocyanic acid, and numerous other drugs, as cardiac depressants. The use of the terms "family" and "order" is to be deprecated for classification purposes in a treatise on therapeutics. Owing to the arrangement adopted, the action of digitalis on the heart and circulation is discussed in an article quite apart from the description of its action as a diuretic, and this is only one of many instances of the same kind of thing. In a work of this magnitude, dealing with so large a subject as therapeutics, many questions necessarily arise on which there may be a legitimate difference of opinion, but these are invariably discussed with great fairness and impartiality, and with abundant reference to original papers. The names of the authors quoted are, however, much too frequently misspelt.

RALPH STOCKMAN.

Alcoholism: a Study in Heredity. By G. ARCHDALL REID, M.B., F.R.S.E. London: T. Fisher Unwin.

THIS work is important for students of sociology and for the medical profession. It goes to the heart of the temperance problem, and of the question of the heredity of inebriety. The temperance party especially will have to reckon with it in pursuance of their single-minded policy towards total abolition. They must overcome not only the historical and social contentions, but also the biological argument—no easy task—before they can proceed unmolested on the present lines. To many medical men the extreme Neo-Darwinian position of the writer may at first sight appear untenable; but sooner or later medicine in these matters follows the trend of the biological sciences, and there need be no doubt that the modern leaders in these sciences are, with few exceptions, prepared to endorse generally the views on heredity which the book contains. The first five chapters are concerned with the question of heredity, and there we have laid down in popular language a very clear refutation of the common belief regarding the transmissibility of acquired characters. In the voluminous appendices will be found a technical discussion of these subjects, among the most interesting of which is an attack on the Spencerian philosophy. That system of philosophy has been so largely built on the Lamarckian doctrine of the transmission of acquired characters, that a loosening of that doctrine would end in its fall. Considering the deleterious effect of its windy materialism upon current English thought, perhaps such a result would not be entirely regrettable. This digression is, however, not meant to produce the impression that our author has succeeded in accomplishing a task so titanic, but to show the importance of the bearing of the whole subject upon current systems of scientific and philosophic thought. To the man who firmly believes in the old doctrines of the transmission of acquired character this book can only appear foolishness; but it nevertheless behoves him to re-examine the basis of that belief in the light of modern writings with a mind unprejudiced, and as far as possible freed from all adventitious side issues, before he can pretend to decide upon the crucial thesis which is here presented.

Chapter vii. deals with the causes of drunkenness. The common-sense manner in which a drunkard is here defined, requires no apology for reproducing it. "Many sober men, and, in particular, many temperance reformers, have a theory very flattering to their self-esteem. They assume that men are drunken or sober according as they do or do not exercise self-control. It does not enter into their minds that a man may be temperate and yet exercise no self-control; in other words, that he may be sober because deep indulgence is not agreeable to him. . . . As a fact, self-control is the principal factor only in those exceptional cases in which the moderate drinker, or abstainer, has both the craving for drunkenness and the opportunity of gratifying it. Let the reader judge for himself. . . . Is he temperate only because he exercises self-control? Does he answer 'yes'? Then from the bottom of my heart I pity him. Continually tormented by his unsatisfied craving for drunkenness, he must indeed be a miserable being—a being only one degree less miserable than an actual drunkard. . . . A certain section of moderate drinkers. . . . would doubtless enjoy deeper indulgence, but the craving is not so strong as to balance their dislike to the consequences. A remainder so delight in alcohol, are so driven to it as by the force of a tempest, that, ignoring the remote consequences, they seek immediate satisfaction and are intemperate."

From this point onwards until the end of the twelfth chapter, the author's views on the selective action of alcohol as an agent in evolution are set forth. These views are now so well known as scarcely to require repetition; but the main argument may be briefly stated as follows:—Since the child does not inherit the acquired character of the parent, the craving for alcohol must be inborn. The greater the tendency to indulgence individuals exhibit, the greater their chance of extinction. This is illustrated in the tragic effects of alcohol upon savage nations who have had no previous experience of its use, and who therefore can have had no acquired inherited craving for it. Historical evidence goes to show that the more sober nations are those who have, in the past, undergone alcoholic evolution, and that the more drunken peoples of the present day are now undergoing that process. Consequently legislative attempts to suppress the drink traffic can only eventually result in greater disaster; for they interfere, in this particular, with the law of natural selection. The ineffectualness of the present methods of temperance reformers are exemplified from the writings of two of their number, Messrs. Rowntree and Sherwell, from which it appears that total prohibition and local option become gradually inoperative and finally impossible in proportion as the density of any population to which they are applied increases beyond twenty inhabitants to the square mile. The remaining two chapters are devoted to the author's own solution of the problem: "The experience of many centuries has rendered it sufficiently plain that while there is drink there will be drunkards until the race is purged of them. . . . The only real choice is between natural and artificial selection." In other words, let things go as they are, or forbid progeny to the drunkard. The author is so alive to the boldness of this proposition, and the antagonism to long-established prejudice which it conveys, that he launches into a somewhat ill-judged tirade against what he terms the "Great Procreation Fetish" and all systems of sexual "Tapu." With every sentence of it, more especially with the exposure of the pharisaism which is responsible for the repeal of the Contagious Diseases Acts, every educated medical man will probably sympathise; but it is doubtful if the argument of the book as a whole will be strengthened thereby in the opinion of the general reader.

The book is clearly and cogently written; nowhere is the meaning obscure, and at no point is the reasoning loose or the interest flagging. Its thesis is necessarily controversial, and can only at present appeal to a limited few. But whether the author's views are accepted or rejected, they demand a fair perusal from every one who is interested in the great social problem they so weightily affect.

JOHN MACPHERSON.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

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Fluctuation in Pleural Effusions.

Stenitzer (*Wien. klin. Wchnschr.*, 1901, No. 47), finds Piorry, Trousseau, Wintrich, Skoda, Niemeyer, Eichhorst, and others have recorded their belief in the possibility of obtaining the symptom of fluctuation in cases of pleural effusion; except Wintrich, all of them regarded it as possible only where a large quantity of fluid was present. Lebert and Fräntzel were sceptical.

Stenitzer has been able to satisfy himself that this symptom may be detected much more frequently and under more unpromising circumstances than previous authorities would lead us to believe.

The method by which the fluctuation can best be elicited is, according to the author, as follows. If the effusion be right-sided, an assistant stands on the left side of the patient's bed, the patient sitting and bending forward his body, with the hand placed flatly and lightly on the posterior surface of the right thorax, the middle finger lying along the intercostal space, already chosen for percussion (seventh, eighth, or ninth), he then presses firmly on the part. The examiner then percusses lightly with the second or third finger of his left hand over the space chosen, laying his right hand meanwhile flat and lightly on the lateral surface of the thorax. In this way the presence of fluctuation is easily detected.

Although especially associated with large effusions, Stenitzer has obtained proof of fluctuation in at least one case where the amount of fluid was small. He regards the discovery of fluctuation as of considerable importance in cases where differential diagnosis is attended with difficulty, owing to absence of, or doubt as to, cardinal symptoms, and the volume of fluid is of medium bulk. In children, also, the method may be of great use.

Cyto-Diagnosis of Pleural Effusions.

The first part of Wolff's paper is largely descriptive of methods, and arguments pro and con regarding them. The value for diagnostic purposes afforded by the forms and degree of degeneration shown by the cells in pleuritic fluids is discussed in Part ii. The actual details of argument must be consulted in the original; his conclusions, however, are as follows:—(1) The accepted teaching, that the remains of the cellular elements in exudation fluids, after having become fattily degenerated, are absorbed, is not in accordance with fact. (2) The fat in leucocytes is scanty in amount, unlike in nature all other known fats, and presents peculiar colour reactions. (3) The fat in pleural fluids arises from degenerative processes. (4) Glycogen-holding cells are common, but only when they are fresh and but slightly altered. (5) Antagonism between fatty and glycogenic transformation appears to exist. (6) The nature and degree of degeneration is of no clinical value; the morphological characters of the cells may be of some help.

Consideration of the details given in Part iii., which deals with the morphology of pleural fluids, leads Wolff to conclude that—(1) Morphological details assist etiological diagnosis (especially as to tubercle and acute infectious diseases). (2) Increase of the normal lymphocyte quotient in an exudation, (½ +) points to tubercle. (3) Tuberculous exudations at first present more polynuclear cells; often contain micro-organisms of a peculiar kind (as do other types of exudation), which as yet have not been cultivated. Slowly the character of the contained cells alters; the lymphocytes become predominant. Tapping and withdrawing some fluid for examination every eight days suffices to prove this. (4) It is easier to speak of lymphocytes than to be sure of accurate identification; degenerated polynuclear cells and pseudo-lymphocytes are readily mistaken for them. (5) So also fatty epithelial cells (Ehrlich's large mononuclear). (6) Acute tuberculous exudations contain polynuclear and epithelial cells.

The recent work of Widal and other French observers upon cytodiagnosis, in as far as it bears upon pleural exudation, leads to a very similar result. They lay stress upon the abnormal increase of lymphocytes in tuberculous cases, and even more upon the rare presence of endothelial cells in pleural fluids of tuberculous origin.—P. WOLFF, *Berl. klin. Wchnschr.*, 1901, Nos. 5, 34, and 45; 1902, No. 6.

PULMONARY AUSCULTATORY METHODS.

ROSENBACH (*München. med. Wchnschr.*, January 28, 1902) discusses two questions relating to pulmonary auscultation.

(1) What type of breathing gives most satisfactory results in auscultation?

Assuming that to many this query may appear supererogatory, convinced from personal experience and on theoretical grounds that slow, deep breathing, broken on occasion by less placid coughs, affords the examiner the best auscultatory results, Rosenbach begs to differ. For does not strict adherence to one method narrow the possible range of discovery? Does not deep breathing often conduce to erroneous interpretation of aural impressions? Auscultation of the heart, whenever any doubt exists as to its soundness, is not considered to be sufficient for proper appreciation of the cardiac state until performed under a variety of different conditions.

(2) Why should the heart be accorded this attention, while one method suffices for the lungs?

Persons of sedentary habit, and females addicted to greater or smaller extent to tight-lacing, are so unaccustomed to breathe deeply, that attempts to do so at command are not conducive to auscultatory accuracy, frequently because of muscular contractions arising from the strain. At the height of forced inspiratory acts, muscle murmurs (pseudo-pulmonary and pseudo-pleural) often are difficult to differentiate from true respiratory murmurs, and may especially prove disconcerting, when for some reason or other the results of percussion are indefinite. Some there are in whom no respiratory murmur can be detected during long, slow respirations. Rosenbach recommends for these reasons that pulmonary auscultation should always be carried out during rapid as well as slow, deep breathing. Energetic muscular movements on the part of the patient, preceding auscultation over the apices, facilitates and strengthens the acts of respiration and favours observation.

Rapid but vigorous respiratory efforts seem to improve the acoustic character of the pulmonary audible phenomena, exactly as increase in strength of the cardiac contractions renders the beats and murmurs more distinct. From this it follows that the velocity with which air is entering and leaving the lung may be a greater help in auscultation than the actual amount of air involved.

SO-CALLED FATTY HEART.

HIRSCH (*München. med. Wchnschr.*, November 19, 1901) first alludes to the purely empirical belief that the metabolic processes of the obese are less capable than in the average man, and that the stout fail to combat acute diseases so readily. Clinically, however, the cardiac lesions of the stout—even of the equally stout—are frequently dissimilar; while many fat persons exhibit no signs whatsoever of the circulatory system, nor any diminution of physical powers.

Four types may be differentiated upon broad lines—(1) The most frequent type, with difficulty in breathing, palpitation, and slight fainting attacks on even slight exertion. (2) A type characterised by feelings of dread, cardiac pains, from simple sensations of discomfort to true angina pectoris. (3) A less numerous class suffer from severe attacks of syncope, difficult of diagnosis at first from apoplexy. Stokes called attention to cases of this type, and to the Cheyne-Stokes breathing and bradycardia frequently associated with them. (4) The advanced cases with pronounced cardiac insufficiency, orthopnœa, and dropsy.

That the results of circulatory disturbance in the obese can vary so widely in character, suggests that each variation is associated with a special anatomical lesion.

The mistake frequently made by physicians, even now, of labelling all cases in which the heart suffers, or is supposed to suffer, from the inconvenience of having too much adipose tissue to deal with, by the comprehensive but vague name of "fatty heart," is insisted on by Hirsch. "Fatty heart" is a term used to cover several diverse conditions; Leyden's suggestion, "cardiac disorders of obesity," constitutes a more rational name.

"Posture" Treatment of Bronchiectasis and Bronchial Catarrh.

Ewart recently showed, at the Clinical Society, two patients illustrating a method of treatment originally described by Quincke of Berne for cases of bronchiectasis and chronic bronchial catarrh. The essential feature of the method consists in keeping the foot of the patient's bed raised to a considerable height whilst the shoulders remain low, only the head resting on the pillow. Blocks of wood, varying in height from 8 to 18 in., in different cases, are used for the purpose. In this way the fœtid and irritating secretions of a bronchiectatic cavity, instead of accumulating and being expelled in large gushes, and after severe coughing, drain mechanically towards the trachea, and are expectorated without the deleterious strain of prolonged coughing. Moreover, the maintaining of the cavity in an emptied condition, diminishes the absorption of toxic products from the long-retained secretions. Evidence of this was shown in one of Ewart's cases by the immediate fall of the temperature to normal.

In addition to raising the foot of the bed, Ewart recommends respiratory exercises, with the object of improving the ventilation and circulation in the damaged lung, and to encourage re-expansion of pulmonary tissue in order to fill up the space previously encroached upon by retained secretions. Antiseptic inhalations are also of value. —*Brit. Med. Journ.*, London, 1902, vol. i.

SURGERY.

UNDER THE CHARGE OF

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Sub-Cortical Glioma of Left Ascending Frontal Convolution.

This case, reported in great detail by Stewart of Montreal, forms a valuable contribution to our knowledge of the nature of the speech disturbances arising from lesions in the lower part of the left ascending frontal convolution. It refers to a man, æt. 37, who without previous warning suddenly became speechless for about twenty minutes. There was a recurrence of attacks of a similar character every few days for a period of several weeks. Then severe headache and optic neuritis supervened, and afterwards facial spasm followed by paresis of the lower facial muscles on the right side, as well as weakness of the right half of the tongue. The "mutism" was no longer noticed, its place being taken by a dysarthria, first of labials, and later of all letters and words, and finally passing on to a practically complete anarthria.

On the brain being opened by Professor Bell, a tumour was found immediately beneath the grey matter of the lower part of the ascending frontal convolution. The removal of this was easily accomplished, and was followed in the course of a few days by disappearance of the anarthria and the facio-lingual paralysis. Two months after the operation the patient was practically well, the only evidence of any disturbance of the central nervous system being some degree of slowness of speech. This case is interesting as showing that dysarthria and not aphasia is the characteristic form of speech disturbance met with in growths in this situation. The growth was so situated as to compress the speech tract some distance from the motor speech centre, but still sufficiently near to involve the commissural fibres that pass over to the right hemisphere in the corpus callosum. The patient exhibited also a marked disorder in writing, of the nature of an "ataxia" or "dysgraphia." There was no weakness of the right hand, and the difficulty is to be explained by a disturbance of co-ordination. It, too, passed off after the removal of the tumour.—*Am. Med.*, Phila., December 21, 1901.

SUBPHRENIC ABSCESS FOLLOWING APPENDICITIS.

CHARLES A. ELSBERG has tabulated seventy-one recorded cases of appendicitis complicated by subphrenic abscess, and he adds two new cases of his own. He estimates that subphrenic abscess occurs in about 2½ per cent. of cases of appendicitis with abscess formation around the appendix. The commonest mode of origin is by direct or lymphatic extension from the diseased appendix. More rarely it occurs in the course of a general systemic infection or as a localised part of a general purulent peritonitis. The inflammatory process may reach the right subphrenic region by an extraperitoneal route, passing upwards behind the colon and kidney; or by an intraperitoneal route, passing in front or at the side of the colon. The route followed depends on the relation of the appendix to the colon. The pus in the abscess is thick and foul, and in about 15 per cent. of cases contains gas. The onset of the subphrenic abscess may occur—(*a*) a few days after the acute symptoms of appendicitis have subsided, (*b*) before the subsidence of the acute symptoms, or (*c*) even several weeks after apparent recovery from the appendicitis. It is often very difficult to diagnose between pleural effusion, subphrenic abscess, and a combination of the two. In abscess there is tenderness over the eighth and ninth ribs in the axillary region, respiratory signs are absent, the liver is frequently depressed. When there is gas in the abscess, the liver dulness may be lost. Localised œdema is often present in abscess. In pleural effusion the upper level of the fluid tends to have a concave upper limit and to vary with change of posture, the intercostal spaces bulge, and the heart is liable to be displaced. When the two conditions exist together, respiration at different levels may be the only means of arriving at an accurate diagnosis.

Perforation of the diaphragm is infrequent, and, where it does occur, brings about immediate thoracic symptoms. Elsberg considers Litten's diaphragm phenomenon, and Fürbringer's test (the movements of the aspirating needle during respiration) of comparatively little value in distinguishing effusion from abscess. Abscess of the liver is rare, and is accompanied more frequently by chills and profuse sweats. The seat of pain, moreover, is in the majority of cases in the region of the right scapula. The appearance of the pus on aspiration will settle the point.

Of seventy-three cases the total mortality was 40 per cent.—15 per cent. after operation and 25 per cent. without operation. Sixty per cent. of cases were cured, and, of these, four were not operated on, rupture into a bronchus occurring in three.

The *method of operation* the author recommends, and which he has followed in six cases, consists in resection of 2 in. of the ninth and tenth ribs between the scapular and anterior axillary lines. In the absence of adhesions, he prefers suture of the layers of pleura to packing the pleural sac with gauze, as advised by Beck. Suture can often be effected without any air entering the pleura. He deprecates the employment of more extensive resection of ribs, as a routine procedure.—*Ann. Surg.*, Phila., December, 1901.

WOUNDS OF THE CERVICAL PORTION OF THE THORACIC DUCT.

SCHOPF reports a case in which this accident occurred in his own practice, and analyses nineteen cases which have been reported up to date. He points out that the loss of chyle which may result constitutes a danger, owing to the consequent inanition, while, if a chylo-thorax is set up, the added pressure effects make the condition all the more serious. As chyle does not coagulate at the body temperature, chylorrhœa may recommence at the first dressing of a wound in which the thoracic duct has been injured at an operation, although the flow may have been checked by a plug during the interval. Ligature of the duct is apt to prove useless, owing to the tenuity of the duct wall. Bleeding from the opening is prevented by a valve at the mouth of the duct.

Attention is called to the frequency of the anatomical variations of the duct: thus it may open at the junction of the left internal jugular and subclavian veins by several mouths instead of one; it may be double throughout all or a part of its course; the freedom of its anastomotic connections may vary widely, and it may open on the right side of the neck instead of on the left. The occurrence of these variations is suggested as a possible explanation of the different results following wounds.

The nineteen recorded cases where the duct was wounded were all cases of operation on the left side of the neck for the removal of new growths or infected glands. In seven of the cases primary ligature was successful; in the remainder chylorrhœa followed, and lasted from three to forty days. Two cases ended fatally, one of these being Schopf's own case. He wounded the duct, in attempting to do a radical operation for mammary cancer with secondary deposits in the axillary and supraclavicular glands. A portion of the internal jugular vein had to be removed with adherent glands at the operation. The wound in the duct was not noticed at the time of operation, as no chyle escaped to attract the operator's attention. At the first dressing, a week after the operation, the leakage made itself evident, and in spite of vigorous plugging the flow of chyle continued till the patient's death a fortnight later. Double chylo-thorax complicated the case. The unfavourable termination is attributed to the fact that the anatomical conditions were not such as to favour the establishment of a collateral circulation, consequently the firm plugging only partly restrained the chylorrhœa and helped to bring about chylo-thorax. Schopf surmises that an unfavourable termination in such a case is more likely than the recorded cases would appear to indicate, owing to the general tendency to report only cases successfully treated.

In discussing treatment, he suggests that, in addition to ligature or plugging, the patient should be kept on a diet rich in fat and egg albumin, in order to promote a copious flow of chyle, and in this way to encourage the establishment of a free collateral circulation.—*Wien. klin. Wchnschr.*, November 28, 1901.

RESECTION OF THE INTERNAL PUDIC NERVE FOR VAGINISMUS AND PRURITUS OF THE VULVA.

IN the paper before us, Tavel advocates this operation, which, although it was originally recommended by Simpson as far back as 1861, does not appear to have been practised to any extent. The author has performed it twice with highly satisfactory results. He employed and recommends sagittal incision—8 to 10 cms. in length—which passes from before backwards across the ischio-rectal fossa, midway between the anus and the ischial tuberosity. The anus lies opposite the middle of the incision. After dividing the integument, the dissection is made towards the inner aspect of the ischium, care being taken not to damage the inferior hæmorrhoidal nerve. On passing the finger over the fascia which covers the obturator internus, the internal pudic artery can be felt pulsating as it passes through Alcock's canal. The inner layer of the fascia forming the canal is divided, and the nerve isolated from the vessels. The inferior hæmorrhoidal and the anal branch of the deep perineal are hooked back and the muscular branches isolated. They are recognised by the fact that, when they are pinched, the muscles contract. The branches which supply the muscles implicated are divided and avulsed after the method of Thiersch. The wound is closed without drainage. In this paper is incorporated a full description of the anatomy of the perineum by Professor Strasser.—*Rév. de chir.*, Paris, February, 1902.

GENITAL TUBERCULOSIS, WITH SPECIAL REFERENCE TO THE SEMINAL VESICLES.

IN the *Ann. Surg.* for 1901, Young of Baltimore described a method of removing the testicles, vasa differentia, and seminal vesicles, by a suprapubic, retrocystic, and extraperitoneal operation. In the present paper he reports two new cases in which he has performed this operation. In reviewing the subject of genital tuberculosis, the author comes to the following conclusions:—Primary tuberculosis of the epididymis occurs, and is probably the most common initial lesion. The deposit is generally in the globus minor. It is true, however, that the epididymis may be involved secondarily to the vesicles or prostate. The progress is very variable in its rate. In the invasion upwards of the vas, the middle portion often escapes. The ampulla is a favourite site of disease. The ejaculatory duct and neighbouring vesicle are next involved, and then the prostate, whence the disease spreads to the urethra and bladder. It is well established that implication of the prostate and vesicles does not contra-indicate operation, as the disease, in a majority of instances, disappears after epididymectomy or castration. It is an advantage to conserve the testicles where possible, as they appear to have a distinct use in preserving the organic equilibrium. The "moral effect" so often following on castration does not occur after epididymectomy. As regards the operation, Young considers that in simple localised tubercle of the epididymis, epididymectomy is preferable to castration, and that, even in the simplest cases, the vas should be followed as far as the ureter. In extensive local disease of the epididymis and its surroundings, castration should be done if the disease is unilateral; if it is bilateral, epididymectomy is preferable. When the seminal vesicles and prostate are involved, these organs should only be attacked after epididymectomy or castration has failed to check the progress of the disease in them.—*Ann. Surg.*, Phila., November, 1901.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Pathological Changes in the Fœtus in Cases of Puerperal Eclampsia.

Alfieri (*Ann. di ostet.*, Firenze, 1901), as a result of his investigations, comes to the following conclusions:—(1) That certain changes are found in the organs of the fœtus, corresponding to those affected in the mother; (2) that those changes are not constant, nor characteristic of eclampsia; (3) that the lesions found in the kidneys, suprarenal bodies, and liver may have caused the death of the fœtus, but, on the other hand, they may merely be the expression of a toxic condition, and that other factors may have caused death; (4) that anatomical and pathological researches on the fœtus have so far failed to substantiate the belief in the fœtal origin of eclampsia.

Tuberculosis of the Portio Vaginalis and Cervix Uteri.

Beyea (*Am. Journ. Med. Sc.*, Phila., 1901, vol. cxxii. No. 6) points out that tuberculosis of those parts is very rare, and has met with but scant attention. He has collected seventy cases from the literature. Of those, thirty were discovered on post-mortem examination associated with tuberculous lesions in other parts of the genital canal and body; two cases of primary tuberculosis of the cervix were also discovered on post-mortem examination; fifteen cases, observed clinically and confirmed subsequently by post-mortem examination, where tuberculosis of the vagina and cervix was associated with similar lesions in other parts of the body. The disease is most commonly found between the ages of 21 and 30 years.

The clinical characters can be divided into three groups:—

1. **Ulcerative Group.**—The ulceration in some cases was large and single, in others multiple and minute. The ulcers were excavated,

yellowish white, and with sharp edges. The cervix was often found to be hypertrophied. In the early cases the lesion was localised to the mucous membrane.

2. TUBERCULOUS HYPERPLASTIC ENDOCERVICITIS.—This involves the cervical mucous membrane, specially the lower half, and extending into the vaginal portion like an erosion. The growth consists of small papillæ, rose-red in colour, and rarely showing any signs of caseation.

3. MILIARY TUBERCULOSIS OF THE CERVIX.—Two cases have been recorded in which minute miliary tubercles were found scattered over the vaginal portion of the cervix, associated with extensive tuberculosis in other parts of the body.

Most cases of tuberculosis of the cervix are due to secondary infection; only three cases have been definitely stated to be primary.

Symptoms.—The most constant is a very profuse purulent leucorrhœa, occasionally tinged with blood.

Diagnosis.—The papillary form resembles the cauliflower epithelioma of the cervix, but does not bleed so readily when touched; furthermore, the lesions are not so friable, and they possess an elastic velvety feel. The ulcerative form may be mistaken for an excavating carcinoma of the cervix, but here also the lesions are not friable, are elastic to the touch. The history, age, and duration of the disease are important in forming a diagnosis as to the real condition present.

Treatment.—As a rule operation is called for. If the lesions of the genitals are the cause of the patient's illness, hysterectomy is indicated. If there are extensive tuberculous lesions in other parts of the body, cauterisation of the cervix should be employed.

ECLAMPSIA.

HURZFELD (*Centralbl. f. Gynäk.*, Leipzig, 1901, No. 40) summarised the pathological conditions in eighty-one post-mortem examinations. All showed lesions of the urinary tract. In 46·6 per cent., chronic nephritis was present, acute nephritis in 31·1, bilateral compression of the ureters in 22 per cent. Kundrat has shown that this compression occurs only in primiparæ at an advanced period of pregnancy, and is found in cases in which an unusually high or low division of the common iliac artery causes the ureters to be pressed further forward than normally against the uterus. In thirty-two of the eighty-one cases hæmorrhagic hepatitis was present, and in four of these ureteral compression was also present. In twenty-eight, parenchymatous change of the liver and kidneys was noted, complicated in four cases by compression of the ureters. In twenty-one cases no macroscopic lesions of the liver were seen, and in ten of these the ureters were compressed.

From these statistics Hurzfeld concludes that the disposition to eclampsia arises from changes in the uropoietic system. He advocates early and rapid delivery, and in primiparæ advocated Cæsarean section as the best procedure.

UNIQUE CASE OF EXTRA-UTERINE PREGNANCY.

TUHOLSKI (*Am. Gynæc. and Obst. Journ.*, N. Y., December, 1901) records a case where the gestation sac containing a very young fœtus escaped from the tube into the peritoneal cavity, and there becoming implanted and forming real placental connections, developed and went to full term. The case occurred in a 6-para, æt. 39, who presented the symptoms of an extra-uterine pregnancy. Tuholski operated, and on opening the abdomen found the lower margin of the liver midway between the umbilicus and the symphysis pubis. On raising the liver, he discovered on its under surface a circular swelling traversed by several large arteries and veins. The tumour was cystic and pulsating. The patient's condition was so bad at the time that no further exploration was made. Some weeks later, examination showed a great enlargement of the upper right side of the abdomen, and the fœtal heart and movements could be easily made out. Tuholski performed a second laparotomy, and, after dissecting through the tissues, he reached a sac; this was opened, and a healthy female child, weighing 6½ lb., was removed. The cord was tied, and the cavity firmly packed. The patient survived the operation only for thirty-two hours, dying of hæmorrhage. On post-mortem examination, the liver was found to be enormously enlarged and very vascular. The placenta occupied the right hypochondriac part of the right lumbar region, and was attached to the diaphragm, liver, and kidneys. The intestines were free, the uterus was enlarged, while the left ovary and tube were thickened.

Enemata in Hyperemesis Gravidarum.

Condamin (*Lyon méd.*, February, 1902) strongly recommends the treatment of this condition by saline enemata. It has yielded highly satisfactory results in eight cases in which he employed it. From 5 to 7 pints are injected daily, ½ pint being administered at frequent intervals. No food is administered by the mouth at this time. The procedure should be followed for six days, when a little soup can be administered. The appetite gradually improves, and the patients improve rapidly; and so far no return of the hyperemesis has occurred. In cases where the rectum is intolerant, a few minims of tinct. opii should be administered in each enema, and if then the irritation continues, subcutaneous injections of saline fluid are indicated.

THERAPEUTICS.

UNDER THE CHARGE OF

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Diet in Gastric and Intestinal Disorders.

Schmidt holds that one of the chief uses of gastric digestion is the reduction of the food to a uniform pulp. Thus, if a piece of bread be put into the gastric juice, in a short time it will break down, leaving a soft pulp. This is due to the action of the acid on the gluten, and does not denote true digestion. Similarly, peptic digestion of meat forms flocculent scales, from the action of the acid on the connective tissue freeing the muscle fibres. In the absence of free acid these results do not occur. In tryptic digestion of meat the lump gradually corrodes, while the connective tissue is left protruding, as it is not acted on. Quite a good test for gastric digestion is the presence of a uniform pulpy fluid. The attempts to apply these observations clinically led to the use of raw or smoked meat in gastric conditions. The raw meat is given scraped, to eliminate the connective tissue. The process is very tedious, and probably is seldom properly carried out. Raw meat increases the gastric secretions, and has the power of combining with the free acid. After its use the total acidity is increased, but free acid is diminished. The meat extracts also stimulate secretion, but cooked meat and carbohydrates have less power. In subacid and anacid conditions it is occasionally advisable to stimulate the secretions, and for this raw meat has been advocated. Owing to the absence of acid, the meat is not broken down into flakes, so that Schmidt prefers meat extracts, which are equally stimulating, and do not require digestion. If meat is to be given, it should be well cooked and finely powdered. In hyperacidity, raw meat by its power of fixing free acid gives great subjective relief. For a cure, however, rest to the stomach and its glands, by means of a bland unirritating diet, is better. To relieve excessive discomfort, use alkalies. Thus, neither in excess nor deficiency of the gastric acid does Schmidt use raw meat. On the other hand, he finds starchy foods useful in hyperacidity, provided there is no fermentation. It has been urged that, owing to the excess of acid, the amylolytic action is soon stopped, thus favouring fermentation, and further that digestion is hindered. The first is probably true, but the second objection has no weight, as the chief action is the mechanical subdivision and not saccharification. The diet may include carbohydrates, except sugar, which is easily fermented, but should not contain highly spiced or irritating substances. To insure rest for the stomach is of great importance. Schmidt gives the last meal at 6 or 7 P.M., and then nothing, except an alkali, till next morning. As the hyperacidity is least troublesome during the forenoon, he gives then three fair meals at intervals of two hours. Then, after a rest of three hours, the mid-day meal is taken, with nothing further till the evening meal. Of great importance in the early stage is complete rest in bed. Even after the patient is going about, Schmidt advises lying down for two hours after dinner and early retirement after supper. Our knowledge of intestinal digestion is more limited than that of gastric processes. Still a great deal can be learnt from systematic examination of the fæces. Apparently even in healthy individuals the intestinal processes have little effect in reducing the size of starch granules, as in potatoes. Hence he lays down the general rule, that all foodstuffs in irritation of the intestines should be given in as finely divided a state as possible. This applies also to drugs. He prefers milk somatose containing 5 per cent. of tannin to the insoluble tannigen and tannalbin. The next rule is to give the food in the easiest digested form. Milk is the best food, but it often disagrees, either from fermentation or from abnormal susceptibility of the intestines to the normal products of digestion. A very good plan is to add to 1½–2 litres of milk 0·25–0·5 grm. acid salicyl. Rub the acid with a little cold milk, then add it to the rest of the milk and bring to the boil. This not only renders the milk aseptic, but prevents it from being acted on by intestinal germs. It is more rational, and requires less antiseptic, than giving antiseptics after the food. For infants 0·1 grm. to the litre is sufficient. Fats are often quite well borne in gastric conditions, and help to regulate the bowels. At the end he mentions that often, by allowing the fæces to incubate for twenty-four hours, one can find out what portion of the diet is disagreeing. If the fæces ferment, turn acid, and have the odour of butyric acid, the carbohydrates are at fault; while great putrefaction, stinking odour, and alkaline reaction point to proteids. In such cases, stop all the carbohydrates or proteids for a few days. This often effects a cure, as the intestinal bacteria take some time to adapt themselves to the changed conditions.—*München. med. Wchnschr.*, 1902, Nos. 6 and 7.

Iodic Purpura.

In this paper Stengel records a case of purpuric iodism. Of the skin manifestations of iodism, purpura is the least common, still a good number of cases have been recorded. In the first part of the paper, the question of syphilitic purpura is discussed, but the author comes to the conclusion that there is a well-marked form of iodic purpura occurring in non-syphilitic cases. The purpuric eruption varies in character. In many of the recorded cases its location was on the lower limbs, resembling that of rheumatic purpura. It may also come out in crops. Several observers state that in their cases there was an absence of pain and constitutional symptoms. In other reports there have been noted itching, and hæmorrhages from the mucous membranes. There may be ordinary signs of iodism, or more severe symptoms. While in some cases painlessness is a distinguishing symptom, in others pain and swelling of the joints may be observed. Only in a few cases have rises of temperature been noted, but this may be due to the fact that, as a rule, in chronic cases requiring iodides the temperature is not kept. Usually purpuric iodism is a manifestation, not of acute iodic poisoning, but of subacute or chronic intoxication. Still here, also, exceptions have been noted, and one case is on record where the administration of 1 gr., t.i.d., for fourteen days, was followed by purpura. In another case, two 5-gr. doses caused purpura. In most cases iodide in any form is equally hurtful. Total withdrawal of iodides is usually followed by an immediate improvement. Renewed administration causes relapse. The case Stengel reports is a good illustration of the febrile form of purpuric iodism. The patient, æt. 23, was admitted to hospital for typical asthmatic attacks. During a stay of six weeks he had repeated attacks of asthma, and, in addition, one or two slight febrile attacks, supposed to be due to influenza. After six weeks he was put on iodide of potassium, 5 grs. t.i.d., on 12th February. On the 23rd this was raised to 8 grs. t.i.d. He got worse during the early part of March, having continual bronchitis and moderate fever, which continued till, on 19th

March, a few purpuric spots were noted on his legs. The fever rose to 102°, 103°, and 104°. The general condition became worse. On the 21st he complained of pain in the joints. Next day a second crop of hæmorrhages appeared, affecting the legs below the knees, and also the left forearm. The gums were tender and spongy, showing a bluish cyanosed line near the teeth. The condition became worse, the eruption involving also the right forearm. The chief seat was, however, still the calves and sides of the feet. In the forearm there was swelling, erythematous redness, and pain. The joints were probably slightly swollen. The thyroid gland became decidedly enlarged, with tachycardia and tremor of the hands. The patient was very collapsed. On the 23rd the iodide was withdrawn and an antiseptic mouth-wash given. Next day the patient was better, and the eruption fading. In a few days the recovery was complete, and the patient subsequently left the hospital. During the fever there was a pronounced leucocytosis. In two further cases of his, in which iodides were given, Stengel found febrile attacks, one in a chronic nervous case, and the other in a girl who developed severe iodism. In the diagnosis of the case, Stengel lays weight upon the pronounced tendency of the spots towards clustering and clumping. This, with the symptoms of fœtid breath, soreness and sponginess of the gums, with tremor of limbs, tachycardia, and great perspiration and swelling of the thyroid gland, made the diagnosis easy, and excluded ulcerative endocarditis.—*Therap. Gaz.*, Phila., 1902, No. 1.

Quinine Rash.

Wood reports in the same journal a case of quinine rash in a woman, who took as a tonic a mixture containing tincture of nux vomica and tincture of cinchona. The dose of quinine was not more than ½ gr. After two doses she experienced tingling in the forearm. In a short time these areas became red. On examination, a number of spots on both extensor and flexor surfaces were found, almost circular, quite regular, from 2 to 5 cms. in diameter, of a deep red colour in the centre, shading slightly towards the periphery, and surrounded by a slight macular rash. The surrounding skin was quite appreciably elevated in temperature. There was slight itching, but no constitutional disturbance or involvement of the mucous membranes. Four days later the most of the spots were fading, some actively desquamating. Workers among quinine suffer from eruptions. In addition to his own case, Wood has collected from the literature sixty cases of quinine eruption. The rash may be very puzzling. It may be scarlatiniform, urticarial, bullous, purpuric, rubeoloid, or erythematous. The most common forms seem the erythematous and scarlatiniform, forming thirty of the sixty recorded cases. Then comes urticaria. There is no special predisposition towards any particular portion of the body. It must be noted that involvement of the mucous membranes and desquamation have been reported in eleven and fourteen of the cases respectively. As a rule the eruption developed soon after taking the drug, usually within a day. The shortest time was ten minutes, and the longest was two days after the dose. The rash lasted from one to three days in 20 per cent. of the cases. Some cases last a week longer. Neither age, sex, nor size of dose seem to have much effect as determining causes. Most of the patients had had more than one attack. The condition is probably due to an idiosyncrasy, which may either act through a vasomotor paralysis or be due to excretion of the quinine through the skin, causing irritation. The treatment can only be symptomatic, using mildly astringent lotions. —H. C. Wood, jun., *Therap. Gaz.*, Phila., 1902, No. 1.

Hypodermic Injection of Carbolic Acid in Tetanus.

This method of treatment was introduced by Baccelli. Some thirty-four cases successfully treated by it are already on record. Musgrove now reports another success. A man stepped on a nail, causing a wound 1½ in. deep, which was swabbed out after six hours with pure carbolic acid. There was some suppuration, till on the fifth day a small pledget of shoe-leather was discharged. The wound then healed. After working for a week, there was complaint of soreness in back, neck, and stiffness of jaws, and in the course of three days tetanic rigidity developed. Morphia was injected, and 1·2 gr. of acid carbol. in a 2 per cent. solution was injected hypodermically every four hours, making 7·2 grs. daily. The rigidity was diminished after three days, only occasional exacerbations occurring. The treatment was maintained for two weeks without any untoward symptoms or cloudiness of urine. The patient was then perfectly cured. The treatment is cheap, and easily carried out.—Musgrove, *Merck's Arch.*, January, 1902.

Aix Treatment of Syphilis carried out at Home.

Houchin claims that the inunction method can be quite efficiently carried out in ordinary practice without having to send the patient to home or foreign spas. It is necessary at the commencement to put the patient's mouth into a healthy state, carious teeth being either extracted or stopped, and healthy teeth being carefully scaled. To prevent salivation, a mouth-wash of pot. chlor., 10 grs. to the ounce, with or without some mild astringent, should be used night and morning, and after meals. Before the inunction, the patient should soak for half an hour in a hot bath (of from 98° to 100° F.), to which can be added some mineral salt to render the skin soft and receptive. After coming out of the bath, the patient is dried with warm towels, and goes into a warm bed, and rubs in not less than 1 drm. of the B.P. ung. hydrarg. The body is divided into five parts, one of which is selected for inunction every alternate day, till twenty-five to thirty inunctions have been made, which constitutes a course, and takes about six months. To effect a cure, two or three courses are necessary in ordinary cases. The inunction should take half an hour, and is best done by means of a glass rubber, which is clean, and insures the patient getting the whole of the inunction. Any ointment remaining on the skin should not be rubbed off. Houchin claims that this method allows the patient to remain under the doctor's supervision, enabling the patient to attend to his business, and avoids the expense and notoriety of a visit to a spa. It also causes a maximum amount of mercury to be introduced into the system without disturbing digestion and intestines. This leads to more satisfactory results than prolonged and small dosage, where the patient usually gets careless after a time and omits treatment. Cachexia is seldom seen with inunctions; usually there is gain in weight, colour, and nutrition.—*Journ. Balneol. and Climat.*, London, January, 1902.

INSANITY.

UNDER THE CHARGE OF

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THE INSANITY OF INTROSPECTION.

VASCHIDE and Vurpas (*Centralbl. f. Nervenheilk. u. Psychiat.*, Coblenz u. Leipzig, July and August, 1901) deal with the above subject in two lengthy articles, founded upon an intimate psychological analysis of a single case. They claim that the old designation "insanity of negation" is misleading, and that the symptoms of the latter insanity do not, as has been held by Cotard and Séglas, depend upon disordered sensibility and peripheral hallucinations in the first place, but upon defective nutrition and disordered bodily function, transformed by a morbid introspection into hallucinations, delusions, and finally an altered personality. The great majority of men pass through life, in a sense, unconscious of their mental activity, and above all of the psychodynamic mechanism which presides over the evolution of their organism. When a moral shock, a powerful emotion, mental troubles due to alcohol or any other toxin or cause, attracts attention to previously hidden corners of the organic territory, the individual may forthwith begin to systematise an insanity, true in its constituent elements but false in its synthetical conclusions. Such a systematised insanity develops quickly or slowly according to the mental equilibrium of the subject, to his power of comprehending the significance of his symptoms, and according to his constitutional manner of thought and reasoning. In the so-called insanity of negation, in hypochondria, and in certain forms of the insanity of persecution, the origin of the insanity is the same. Given a certain degree of hereditary abnormality, a disorder of metabolism due to some definite cause, whether ascertained or not, and a morbid power of introspection, and it is possible for an individual by a process of logic, correct it may be in itself, to develop a so-called "parasitic" form of thought, accompanied by hallucinations which together constitute the insanity. At the same time, it may be evident that there is no general mental weakness, no failure of memory, and no intellectual defect apart from the subject proper of the malady. Such insanities are due to an incessant introspection, which analyses, in the light of a preconceived idea, sensations which, until now, had remained latent, and which are therefore considered by the subject to be abnormal. The authors, convinced of the truth of their position, propose to group all such insanities under the title, "Insanity of Introspection."

THE CLINICAL CLASSIFICATION OF INSANITY.

DERCUM of Philadelphia, in a very able article (*Journ. Nerv. and Ment. Dis.*, N. Y., September, 1901), lays down his views on the methods of classifying insanities in accordance with modern clinical research. He concludes as follows:—

All the mental disorders which result from infections, intoxications, diatheses, etc., belong to the symptom group of delirium, confusion, stupor, dementia. The various forms of this group are closely related, and it must depend largely upon the activity of the morbid process and upon its character as to which of these forms is present in a given case.

The melancholia-mania syndrome bears no relation to the various infections, intoxications, or visceral diseases. Neither mania nor melancholia ever results from them. Mania and melancholia are diseases primarily of the nervous system—*neuroses*, so to speak—and are largely hereditary.

Much confusion has arisen from the loose and unscientific use of the words mania and melancholia, and in this respect alienists, neurologists, and general practitioners have alike been guilty. To speak of a delirium as a mania, because it happens to be attended by excitement, is certainly a gross misuse of terms, and cannot be too strongly condemned. To designate a confusional insanity as a melancholia, merely because the delusions are distressing or painful, is equally unscientific and reprehensible. To say that a melancholia is caused by typhoid fever, or that acute mania is caused by the abuse of alcohol, is to utter nonsense. Mania and melancholia are phases of a special syndrome which bears no relation to such causes. When a mania or melancholia actually occurs in a person who has suffered from such causes, the relation is to be regarded as accidental, or at most that the antecedent disease allowed the neurosis to become manifest, but was not itself a cause. I venture further to say that such coincidences are of the utmost rarity. Again, the relation of the internal medical diseases to paranoia is of like nature. Thus, we often speak of an alcoholic paranoia. The truth doubtless is that alcohol of itself can never cause paranoia; but, on the other hand, it is probable that in persons already paranoiac by organisation, the alcohol causing mental degeneration brings the paranoiac weakness to the surface; and this is no doubt also true of the action of other poisons. To conclude, melancholia-mania and paranoia—as well as the neurasthenic-neuropathic insanities—bear no relation to internal diseases. All causes, however, that are attended by persistent depression of nutrition, or by degenerative changes in the nervous system, may favour their onset. The rarity of a clinical history of a case of melancholia-mania even presenting such a relationship is of sufficient significance.

THE BACTERIOLOGY OF ACUTE DELIRIOUS MANIA.

AT the Congress of Alienists and Neurologists held at Limoges in August of last year, MM. Carrier and Martin submitted a report on the clinical, pathological, and bacteriological aspects of this disease (*Arch. de neurol.*, Paris, September, 1901). They state that in 1881, Briand discovered micro-organisms in considerable quantity in the urine. In 1884, Rezzonico found emboli of micrococci in the cerebral blood vessels. Bianchi and Piccinino found bacilli in the blood of two cases, and these observers were able to isolate an autonomous bacillus, corresponding morphologically to the *Bacillus subtilis*, but they admitted later that this organism was not present in all the cases they had afterwards examined. Out of seven cases they found a streptococcus in four and a staphylococcus in two. Rasori in 1893 found Bianchi's bacillus in the cerebro-spinal fluid in one case. Potts, Martinotti, and Cabitto found only ordinary micro-organisms. Ceni, in 1897, found constantly the *Staphylococcus pyogenes albus*. Kotzowsky (1898) found a staphylococcus in two cases. Cappelleti (1899) confirmed the researches of Ceni and Kotzowsky: in three cases he isolated the *Staphylococcus pyogenes aureus* and *albus* and the *Bacterium coli*. Again, in 1899, Bianchi and Piccinino published a memoir in which they claim to have found their special bacillus in two cases; in a third case, only ordinary cocci; while, in a fourth, their researches were negative. The authors of the paper conclude that these researches by various authorities tend to show that the complex symptoms of the disease may be due to various organisms, and that its gravity depends greatly upon the pathogenic character of these organisms.

DERMATOLOGY.

UNDER THE CHARGE OF

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RECURRENT HERPES.

Dubreuilh and Dorso observe (*Ann. de dermat. et de syph.*, Paris, December, 1901) that since the work of Bertholle, in 1876, a certain number of cases of recurrent herpes have been published, but the subject has not been, so far as they know, fully considered. One series affect the face, and of this they relate five instances. The complaint begins in early childhood, then the outbreaks repeat themselves indefinitely, without any regular periodicity and with variable frequency, the interval between successive outbursts varying between several days and as many months. The general health is excellent, there is no important defect, nothing to justify the eruption. A sensation of heat or itchiness, for a day or two before, in the region to be invaded, announces its onset, or even, as in a case of Epstein's, fever, shivering, and a somewhat pronounced neuralgia. There are no gastric disturbances. On the night immediately before, after a tranquil sleep, the sufferer awakes to find a red patch studded with small miliary vesicles. In general, the eruption appears at once; in other cases it is not fully out till the following day. The vesicles are at first clear, tense, full of a colourless fluid, which next day is turbid. They then dry up, and in eight or ten days the crusts fall off, leaving possibly a faint scar. The almost constant seat is the centre or lower part of one or other cheek, but the entire cheek may be covered. We do not know how the disease ends, or how long it lasts, for no observation bearing on this has been yet published. Epstein's had gone on for seventeen years, and showed no indication of ceasing. No treatment tried has seemed to exert any influence, though compresses of formol appeared to check slightly the progress of the ailment. Another variety of recurrent herpes is that form attacking the nates, much more irregular than the preceding one. Those affected are commonly adults, and it is preceded and accompanied by different morbid manifestations, of which the coincidence or alternation with migraine is one of the most striking. Thus a migrainous seizure may antecede the outburst; or a neuralgia located in the territory supplied by the sciatic nerve, generally where the eruption is to appear, at other times at more distant points. It may come out in course of a night, or rarely in successive crops. The most usual site is the buttock on one or both sides, the outer aspect of the thighs, or close to the anus. There may be other kinds of eruption elsewhere, as erythematous blotches or groups of vesicles on the wrists. The glands in the neighbourhood may enlarge. Treatment does not seem to have more effect on this form than on the preceding. A strange result took place in a case of Coriveaud's, in which the pains vanished at once, and wholly, when set to play the violin. Possibly antipyrin, administered just when the neuralgia appears, might have some chance of success. A third type is that of recurrent herpes of the fingers. But few instances have been recorded, and the symptoms are not particularly characteristic, so that a precise description is not yet possible. Hallopeau showed a young woman who had been for three years subject to successive outbreaks of herpes on the sides of the middle finger and in its line on the palm. Epstein relates a case where a doctor contracted an indurated chancre on the left forefinger. Some months after, an eruption of herpes appeared on the inner side of the same finger, accompanied by pain. This recurred at intervals in the same situation many times, and some even left superficial cicatrices.

AN EXTRAORDINARY CASE OF QUININE SUSCEPTIBILITY.

STELWAGON (*Journ. Cutan. and Genito-Urin. Dis.*, N. Y., 1902) observes that cases of eruptive phenomena, from the ingestion of quinia preparations, are common enough in literature, but one which has come under his notice is especially striking, on account of the smallness of the dose necessary, the many ways in which the drug surreptitiously, so to speak, gains access, and the uncomfortable results which follow. The patient is a man of good health, robust habit, and in middle life. So far as he can recall, he has had in all over twenty attacks of a scarlatiniform erythema, followed by branny, lamellar, and sheet-like desquamation, with more or less accompanying itching, and running a course of several weeks. His suspicions were aroused as to the probable cause some years since. When not feeling well, his family attendant gave him quinia, in the average dose, which was promptly followed by the rash, thought to be a second attack of scarlet fever, as it ran a similar course; and in the convalescence from the desquamation, quinine was given to brace him up, and he forthwith had a recurrence. Some time after, a surgeon whom he consulted, and to whom he expressed his belief in his intolerance of quinine, regarding this as nonsense, administered to him a mixture of which the vehicle was the elixir of calisaya, each dose containing an eighth of a grain; another outbreak followed a single dose. Dropping in on a druggist, at that moment engaged in the concoction of a bitter wine of iron, of which he thought highly, he sipped some, and within an hour he was again started on a scarlatiniform cycle of the usual duration. Walking in Boston, a friend expatiated on the merits of a new drink, whose other qualities were enhanced by an agreeable bitterness, due to a trifling amount of calisaya bark; its tentative ingestion had the same consequences as before. On a fishing trip with a few friends, they were joined in the train by another, who brought with him a cocktail for each of the party. This was flavoured with bark; so, in place of going fishing, he had to retire and go through the process of shedding his epidermis. Subsequently, at the end of an acute pulmonary disease, his recovery being a slow one, two consultants, though aware of his idiosyncrasy, agreed that the compound syrup of the hypophosphites, made by a western firm, was the right thing, considering that the amount of quinine contained therein was practically nil, yet a single dose subjected him to the customary ordeal. Casually remarking to his host, at a southern sulphur spring, that he had a slight coryza, he was offered a rhinitis tablet. To insure safety, the book of formulæ of the firm was referred to, and quinine as a constituent was absent. It was swallowed, but a few minutes had hardly elapsed ere the dreaded symptoms manifested themselves. It was discovered too late that the book was an old one, and a more recent list showed that, as then compounded, each contained one-eighth of a grain. While in Paris he ran out of tooth-powder, and went into a drug store to replenish; the druggist recommended a liquid tooth-wash of his own preparation, but the second toilet use of it was followed by a general attack as severe as any. It was discovered that it had in it an infinitesimal quantity of calisaya, to impart a clean and refreshing taste. In Philadelphia, finally, he went into the barber's shop at his club to have his hair cut, which was followed by the application of a hair tonic. While still in the chair, after the hair had been rubbed dry and combed, by a peculiar cutaneous sensation he was led to ask the barber what he had put on his scalp, stating at the same time that he felt as if he had taken a dose of quinine, to which the barber replied that it was a quinine hair tonic he had used. Remarkable to say, and almost impossible to believe, the patient was brought again into another well-marked attack. The application itself did not irritate, nor did the rash begin in the scalp, but the attack was the same as all the others. Naturally these untoward experiences—and those related do not include even all the ones told by Stelwagon—have rendered him chary and suspicious.

THE TREATMENT OF CUTANEOUS EPITHELIOMATA.

ARSENIC has long been regarded as one of the most useful caustics in such conditions, by regular and irregular practitioners alike, but the pain which accompanies its application has been a decided drawback to its extensive employment. Allen (*New York Med. Journ.*, November 9, 1901) asserts that in combination with orthoform this can be largely lessened. He first carefully curettes the border with the smallest spoon which can be used, any crust adhering to the centre of the ulcer being at the same time removed. This prepares the way for the quicker and better action of the caustic paste. While the ooze of blood is being checked by pressure, the paste is prepared as follows.—Equal parts by weight of arsenious acid and orthoform, or, approximately, 1 part by bulk of white arsenic to 2 or 3 parts of orthoform, are mixed with just as much water to form a paste of the consistence of butter. This he packs into the peripheral furrow made by the curette, seeing that it penetrates well beneath the skin, if, as often happens, the scraping has caused an undermining. Then, unless the area is too large, *i.e.* much over 1 in. in diameter, he fills the ulcer cavity level with the skin, or, if there is no cavity, places a thick layer of paste over the part to be destroyed. Encircling this to protect the surface, he paints a ring, ½ in. or more wide, of methylene-blue in collodion. A thinner layer of the same paste, spread on linen or cheese-cloth somewhat larger than the sore, is laid on, fastening down the margins with several layers of the same paint. Should the cancer be near the eye, he seals it up with several coats of the blue collodion, over which is laid plenty of absorbent cotton, overlaid with more collodion. In this way the skin to very near the eye can be acted on. The duration of the application is inverse to the strength of the paste; he indicates that the effect should be observed at the end of eight or ten hours, and then continued or not even up to twice as long.

FRAMBŒSIA.

THE subject of the position of frambœsia has been brought into prominence by the repeated assertions of Mr. Hutchinson, that the disease is identical with syphilis, and is not, as is generally held, a syphiloid disease, though distinct. Some personal observations with reference to this by Jeanselme (*Gaz. hebd. de méd.*, Paris, December 1, 1901), made in French Indo-China, are therefore of interest. It is endemic in Upper Cochin-China. In Laos it is either of recent introduction or it has greatly increased latterly. He thinks it certainly was brought from Siam. The incubation stage is variable and is usually long; the first symptoms seem never to show themselves before the fifteenth day, unless after inoculation, but they may not appear till after several months. Febrile phenomena accompany the invasion, but there are two special features—nocturnal headache and articular and osteocopic pains. At the same time the skin becomes rough and loses its lustre, while patches resembling those of tinea circinata develop, and the palmar and plantar surfaces are thickened and fissured. Next, the typical eruption, differing in nothing from what appears subsequently, and often solitary for from one to three months, shows itself on the lower half of the body. It is a sort of hard boil, covered by a crust, under which is an obstinate ulceration, the exuberant granulations on the floor resembling a cauliflower. This papilloma, after continuing stationary for some weeks, spontaneously subsides, leaving a white macule for a time. Weeks or months after the disappearance of the mother yaw, feverishness and rheumatoid pains announce a general outbreak. Each element at its commencement is a small conical elevation, encircled by an erythematous areola, and having a yellow punctated summit. This, which has certain objective analogies with acneiform and ecthymatous syphilides, may recede or progress. In the latter case the ulcer sends out prolongations, at the same time rising up, so as to become like a raspberry or mulberry. Fully developed it is 1 cm. or 2 cms. in diameter, and if exposed to the air bears a thick, closely adherent crust. This removed, it is studded with soft and succulent vegetations, yellow or rosy, and bleeding readily. A clear, gummy fluid, having a fœtid odour, like that of mucous patches, oozes out and concretes into a sulphur-yellow scab, set with red points. But the elements may grow as large as a macaroon, and, the central portion being absorbed, only a ring or crescent persists. Severe itchiness accompanies the eruption, but the papillomata themselves are nonsensitive, and may be cauterised freely without the slightest pain. When at length absorbed, white or pigmented macules, which fade by degrees, are the sole remnants. In its distribution it approximates to smallpox, and concentrates itself by preference near the natural orifices and in the neighbourhood of the genitals. Rare on the scalp, the hands and feet are favourite sites. Phagedæna may complicate it and prolong its course considerably, leading even to incurable infirmities. Many of those affected have painful exostoses concurrent with the other symptoms, and it is impossible to say whether these are a part of frambœsia or ascribable to coexisting syphilis, since this is also common. It is extremely contagious, and its inoculability has been proved. The initial lesion is situated in the papillary layer, of which the vessels are dilated, along the course of which are numerous plasma cells; the epidermis is thickened; the eleidin, as also the elastic network of the derma, have disappeared. No micro-organism was detected. Of all similar diseases it is syphilis which copies it most closely. From a very complete comparative scheme submitted, the following points of difference may be selected:—

SYPHILIS.	FRAMBŒSIA.
A pandemic disease.	A tropical disease.
Acquired by heredity and contagion.	Acquired solely by contagion.
Auto-inoculation on a person suffering from it ineffectual.	Auto-inoculation is possible during a considerable period of time.
An indurated chancre and other signs of the disease may appear on one who has frambœsia.	Frambœsia may attack one who has syphilis.
Polymorphism of manifestations.	Uniformity, the sole type being the papilloma.
Tertiary forms disorganise the skin, leaving eventually indelible scars.	Nodules which are not exposed to any irritation wholly vanish.
The manifestations correspond historically to three periods—primary, secondary, and tertiary.	All the manifestations are identical, whatever their date.
May be localised on the mucous membranes and viscera.	Avoids the mucous membranes and viscera.
Syphilides are not pruriginous.	Eruptions markedly pruriginous.
Alopecia in secondary period.	No alopecia throughout course.

Though iodide of potassium and mercury are useful in both, this cannot be regarded as an argument in favour of their identity, since iodide also influences favourably actinomycosis, which is absolutely distinct from syphilis.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., F.R.C.P.Ed.,

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THE JUVENILE FORM OF PROGRESSIVE PARALYSIS.

In Kraft-Ebing's clinique twenty cases of juvenile progressive paralysis have been observed within the last ten years. In seventeen of these instances hereditary influences could be positively traced, and in 45 per cent. the patients were, from the onset, of feeble intellectual development. Twelve of the patients were males and eight females. The period of onset varied from the eighth to the twentieth year, figures which agree very markedly with those of Thiry's sixty-nine cases. The condition begins with striking physical and psychical symptoms, which are usually fairly well marked; severe headache, attacks of vomiting, apoplectiform or epileptiform seizures, short lapses from consciousness, with slow recovery of speech preceding characteristic disturbances of speech. Eye symptoms are common, as are also exaggerated knee-jerk, tremor, and sometimes rhythmical movements of the upper extremities. In association with these symptoms, loss of memory and dementia rapidly develop and steadily progress. In all his cases there was but a simple dementia and never maniacal or hypochondriacal delirium. Only once at the height of the disease were optical hallucinations observed. In the final stages of the disease the patients as a rule are confined to bed, as the result of paralytic manifestations in the extremities. The duration of the disease varies greatly, averaging about three and three-quarter years. In twelve cases an autopsy was obtained. There was marked diminution in the size and weight of the brain; the lepto-meninges were much thickened, and there was granular ependymitis with chronic external and internal hydrocephalus and well-marked diffuse sclerosis.

The following differences are pointed out between juvenile progressive paralysis and that of adults:—(1) The hereditary influence as the cause of the juvenile type. (2) The early age at which the disease commences. (3) The fact that commonly individuals of weak mental development fall a prey to this form of paralysis. (4) The prodromal stage being rich in symptoms and characterised by many paroxysms. (5) The fact that at the height of the disease there is, as a rule, only simple dementia, never a paralytic mania; that there are no remissions, and that irritative symptoms as well as paroxysms are often met with. (6) The relatively long course of the disease. (7) The discovery of a diffuse cerebral sclerosis with marked lepto-meningitis at the autopsy.—*Am. Journ. Med. Sc.*, Phila., December, 1901.

AMAUROTIC FAMILY IDIOCY.

COTTON gives an account of this interesting condition, and records of a case which had come under his personal observation in the *Arch. Pediat.*, N. Y., for January 1902. The child was a little girl, æt. 2, and of Hebrew parentage, but there was no consanguinity nor history of syphilis in the parents. Gestation and birth were normal, and the child seemed to thrive well until 9 months, when she was able to stand without support. From this time the little girl commenced to show signs of progressive muscular atrophy and debility, until at length she was quite unable to hold up her head or to use her limbs. Spasticity developed in both upper and lower extremities, and the reflexes became enormously exaggerated. Convulsions of a general character were brought about by the most trifling and unexpected causes. Blindness gradually supervened, and the expression of the child became stupid and idiotic. Ophthalmoscopic examination showed that the discs and the choroids were normal. The feature of the examination was the discovery of a dark reddish brown disc, occupying the situation of the macula, and surrounded by a large whitish zone about twice or two and a half times the diameter of the optic disc. It was possibly a trifle longer horizontally than vertically, and apparently denser near the centre, immediately around the dark-coloured disc, and shading off into the normal red of the surrounding eye ground. The subsequent history was increasing muscular debility, difficulty of swallowing, inanition, and death during a convulsion.

The author had only been able to discover the records of thirty-six cases. As a rule the disorder commences during the first six months in apparently normal children, without any history of a complicated labour, and terminates in death before the third year.

The group of symptoms is sufficiently constant and peculiar to render the diagnosis easy and unmistakable. Amaurosis is always present, and the ocular symptoms recorded in the writer's case have come to be regarded as pathognomonic of this disease. In an early stage of the disorder an ophthalmoscopic examination may fail to discover the ocular changes, owing to their imperfect development, but in more advanced cases they are always present. The most constant symptoms are idiocy, the changes in the macula lutea, and paralysis followed always by an early death. Of the other symptoms recorded there may be nystagmus, strabismus, spasticity, convulsions, tremors, abnormal reflexes, dysphagia, and hyperæsthesia.

Jewish parentage has been noted nearly in every case. The author thinks that the condition is not nearly so rare as the limited number of recorded cases would suggest. The difficulty of making an ophthalmoscopic examination in these infants, the evident lack of mental development, and the welcomed early death, all tend to discourage a painstaking diagnosis. Although most of the reports recognise a suggestive family character to the disorder, many exceptions are observed. Post-mortem examinations, though few in number, seem to establish the fact of a progressive degeneration of the cellular elements of the entire nervous system, though whether primary or secondary is still a matter of dispute. No vascular or inflammatory changes have ever been found. Hirsch's theory, which is supported by Jacobi, is that the disease is caused by an infection possibly derived from the mother's milk. Sachs, however, points out, in opposition to this theory, that two of his cases were not breast-fed.

THE LITTLE FINGER IN MONGOLIAN IDIOTS AND IN NORMAL CHILDREN.

SOME years ago Telford Smith called attention to the marked outward bowing and curving of the little finger which occurs in Mongolian idiots.

The writer of the paper which we are abstracting, and whose attention had been drawn to this statement, was struck with the same peculiarity in the little fingers of several normal children whom he was attending. This fact suggested an investigation of the subject, the result of which was that straight little fingers appeared to be the exception and a certain amount of curvature to be very common. To form an estimate of the various degrees of curvature, and the percentage of the different forms, 605 children under 12 years of age were examined. An analysis of this investigation showed that four varieties of little fingers existed in normal children, which were recorded as follows—(1) Straight, (2) slight curve, (3) distinct curve, (4) marked curve. Of the 605 children examined, 112 had straight little fingers, 175 a slight curve, 199 a distinct curve, and 119 a marked curve. The curving or bowing in this last class corresponds to the condition described by Telford Smith as occurring in Mongols, and skiagraphs taken of those fingers show the same anatomical condition to be present, namely, the short middle and the more or less displaced distal phalanx. The mental and physical development of the children in which this marked curving occurred was fully up to the average. Of nine Mongolian idiots examined by the writer, four had markedly curved little fingers; in three, slight curving was present; and two had perfectly straight little fingers, a percentage which shows a striking similarity to that of normal children.—*Arch. Pediat.*, N. Y., December, 1901.

SPINAL PARALYSIS IN SYPHILITIC INFANTS.

PETERS of St. Petersburg describes a new manifestation of hereditary syphilis, probably due, he considers, to syphilitic arteritis, which produces patches of softening in the superficial part of the cervical and lumbar enlargements of the spinal cord, and causes paralysis of the arms and legs. The most striking feature of the paralysis is the abnormal position of the hand and arm, which Peters calls the "flipper position," because of its resemblance to the fore-limb of the seal, and which is caused by paralysis of the radial nerve and the supinator and extensor muscles of the arm. The disease begins about the fourth month, when it becomes suddenly apparent that the child has lost the power of the arms or legs, or both. When the upper part of the brachial plexus only is involved, then the shoulder muscles alone are affected, and the arm hangs powerless and loose in its socket, and the characteristic "flipper position" is absent. At other times, when only the lower part of the plexus is involved, the shoulder escapes, and we find that the forearm is fully pronated, the wrist drops, the knuckles are directed outwards, and the fist is closed. This he describes as the "flipper position," which he considers quite as pathognomonic of syphilis as palmar psoriasis or condyloma. He ascribes the pain met with in many of these cases to involvement of the sensory nerve root as well as the motor in the cord. If the first dorsal nerve is implicated, the sympathetic fibres to the eye are paralysed, the pupil is contracted, the eyeball sunken, and the lids lie too close together over it.

When the legs are affected, the knee-jerks are lost, some of the muscles are weak and powerless, while others are contracted, and the paralysed muscles lose their electrical reaction. When it is present at birth, obstetrical paralysis must be excluded. The latter is seldom bilateral and the first dorsal nerve always escapes; the subsequent course is also quite different. The absence of fever at the commencement serves to distinguish it from infantile paralysis. Careful examination must always be made to exclude fracture or joint disease. Peters regards the isolated paralysis of the shoulder, or the "flipper position" of the forearm, taken in conjunction with eye symptoms and the scattered nature of the paralysis, as quite sufficient to establish the diagnosis of syphilis. The disease is rapidly cured by mercury and iodide of potassium.—*Jahrb. f. Kinderh.*, Leipzig, March, 1901.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society, *March* 5, 1902.—Prof. T. R. **Fraser**, President, in the chair.—Dr. **Edwin Bramwell** showed a case of meralgia paresthetica.—Mr. **Caird** showed a male patient, æt. 68, after removal of portion of small intestine for tuberculous stricture. —Dr. **Byrom Bramwell** showed—(1) A case of tabes, with acutely developed ataxia, in which great improvement has resulted from Frenkel's exercises; (2) a case of consolidation of the left lung, probably due to an aneurysm pressing on the root of the lung, with subsequent catarrhal changes in the lung tissue.—Mr. **Miles** showed a splint which can be adapted for use as single or double inclined plane.—Mr. **Caird** showed—(1) A cerebral tumour removed from a girl; (2) intestinal tuberculous stricture from male patient.—Mr. **Wallace** showed—(1) *Renal neoplasms* (nephrectomy), (*a*) adeno-carcinoma, (*b*) sarcoma, (*c*) polycystic; (2) tuberculous intestine (enterectomy of 44 in.).—Mr. **Miles** showed—(1) Specimen of spina bifida (with photographs); (2) malignant stricture of œsophagus; (3) specimens from cases of appendicitis.—Dr. **Fleming** showed microscopic specimens of nerves, ten to eighteen weeks after complete division, showing regeneration of nerve fibres in the ununited peripheral portion of the nerve.—The **President** read a paper on "The Relative Inefficiency of Cacodylates as Therapeutic Agents." Compounds of cacodylic acid have recently been recommended and much used as substitutes for the usually employed compounds of arsenic. This recommendation is based on the supposition that, as cacodylates, although rich in arsenic, are almost inert, large quantities of arsenic may, by their administration, be introduced into the body with therapeutic advantage, but without producing inconvenience or dangerous effects. Professor Fraser thought it was highly improbable that a nearly inert compound of arsenic could produce the therapeutic effects of active arsenic compounds, and accordingly treated several cases of chorea with cacodylates for several weeks, with no improvement, though complete cure resulted in a short time when liquor arsenicalis was substituted. Chemical examination of the urine of patients receiving large quantities of cacodylates has also proved that these salts pass through the body in a state of stable combination, with the arsenic so firmly locked up that it cannot be dissociated so as to form pharmacologically active substances, and thus produce the toxic and therapeutic effects of the usually employed compounds of arsenic.

The paper was illustrated by lantern slides.—Dr. NOËL PATON read a paper on the co-ordination of medical research in Edinburgh.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY—CLINICAL MEETING IN ROYAL INFIRMARY.—*March* 19, 1902.—Prof. T. R. FRASER, President, in the chair.—Mr. CAIRD showed—(1) A girl after removal of intracranial tumour; (2) a woman after partial removal of intracranial tumour.—Dr. BOYD showed a case of congenital paraplegia.—Dr. W. ALLAN JAMIESON showed—(1) A case illustrating the combined features of lupus vulgaris and lupus erythematosus on the same patch; (2) a case of lupus erythematosus after prolonged treatment with quinine; (3) a case of parakeratosis variegata (Unna).—Mr. C. W. CATHCART showed—(1) A case of complete rupture of the brachial plexus and one of partial rupture (lower cords) contrasted; (2) a case of excision of gangrenous bowel from strangulated hernia with immediate suture of the bowel; (3) a case in which urgent cerebral symptoms were relieved by tapping the middle fossa in fracture of the base of the skull; (4) a case of Bazin's malady (intractable ulceration of the leg).—Dr. BYROM BRAMWELL showed—(1) A man in whom the stereognostic sense in the left hand was for a time completely lost; (2) a case of Bright's disease in which marked diuresis resulted from the administration of boracic acid.—Mr. ALEXIS THOMSON showed—(1) A patient after suture of penetrating wound of the stomach. A gouge had been pushed through the belly wall below and to the left of the umbilicus, perforating the anterior wall of the stomach close to the lesser curvature. (2) Patient after operation for irreducible inguinal hernia, containing a large diverticulum from the urinary bladder.—Dr. G. A. GIBSON showed an aberrant case of polyneuritis, simulating Landry's disease.—Dr. G. A. GIBSON and Mr. COTTERILL showed a patient with pyloric stenosis upon whom pyloroplasty had been done with much benefit.—Mr. WALLACE for Prof. CHIENE showed three patients suffering from traumatic epilepsy.—Dr. NORMAN WALKER showed—(1) A case of rodent ulcer treated by arsenious acid with complete cure; (2) a case of mild ichthyosis; (3) another case (probably urticaria pigmentosa).—Dr. G. A. GIBSON showed a brain from which a cerebellar tumour had been removed.—Dr. ALLAN JAMIESON demonstrated the new Marshall and Woods lamp for the treatment of lupus by light.

EDINBURGH OBSTETRICAL SOCIETY.—*March* 12, 1902.—Dr. JAMES RITCHIE, President, in the chair.—SPECIMENS:—Dr. GEORGE SIMPSON showed for Professor SIMPSON a fibroid uterus.—Dr. HAULTAIN showed—(*a*) A uterine fibroid showing much attenuated uterine cavity; (*b*) fœtus ectromelus.—Dr. LACKIE showed for Dr. BERRY HART—(*a*) Fleshy tuberous mole; (*b*) cancer of the cervix; (*c*) vascular hypertrophy of the cervix.—Dr. BREWIS showed—(*a*) Ovary, tube, and sac from an extra-uterine gestation; (*b*) ruptured ovarian cyst; (*c*) extensive inflammatory disease of the appendages; (*d*) fibrosis of uterus with small fibroid; (*e*) large tuberculous kidney; (*f*) two ovarian dermoids.

COMMUNICATIONS:—Dr. J. W. BALLANTYNE read a paper on "The Problem of the Premature Infant." He pointed out that in the premature child there was defective adjustment of capabilities to environmental requirements. There was danger to the infant from the loss of the transition period during the last two months of intra-uterine life. The premature infant, anatomically, was a fœtus, and fœtal physiology had to cope with neonatal environment. In the premature child one had to deal with a combination of the pathology of the fœtus and that of the new-born infant. Hence there was greater danger and higher mortality. In conclusion, Dr. Ballantyne discussed the management of the premature infant, and said one ought to aim at prolonging the fœtal phase of life after birth.—Dr. OLIPHANT NICHOLSON read "Further Notes on the Use of Thyroid Extract in Puerperal Eclampsia and the Pre-eclamptic State." The first case was that of eclampsia in a primipara at the beginning of the eighth month of pregnancy. The treatment consisted in the administration of one dose of morphia and subsequently of thyroid extract. The patient recovered. The second case recorded was the further history of a patient reported in vol. xxvi. of the *Transactions of the Obstetrical Society.* This patient had now reached the eighth month of another pregnancy, and had taken thyroid extract continuously and had shown no pre-eclamptic symptoms. The third case was one in which thyroid extract was used for the treatment of pre-eclamptic symptoms at the seventh month. These symptoms disappeared, but the child was born dead some months later. The fourth case was one of puerperal albuminuria, which was successfully treated by thyroid extract.

GLASGOW MEDICO-CHIRURGICAL SOCIETY, *March* 7, 1902.—Dr. NEWMAN read notes of three cases in which aphasia resulted from injury. (1) The patient was admitted, unconscious from a fall on the head. On the third day he had a fit. On the fourth day consciousness returned. As consciousness increased, the fits became more frequent, and it was noticed that there was aphasia. On the tenth day there was slight paralysis of the arm and leg; and on the same day the skull was trephined. When the dura mater was opened, about an ounce of fluid blood escaped. There were no fits after the operation. The patient can now, three weeks after operation, speak quite well. (2) This patient was also admitted, unconscious, with a fracture over the anterior-inferior angle of the parietal bone. Fits set in on the fourth day, and on the following day the skull was trephined. A large quantity of blood was found under the dura mater. Fits ceased after the operation, and consciousness returned. Aphasia was present for twelve days, after which the patient recovered speech rapidly. (3) The history of this case was the same as in the first patient, except that there was no paralysis. No operation was performed. After four months the aphasia had not completely disappeared.—Dr. J. LINDSAY STEVEN showed specimens from a case of tuberculous pericardio-mediastinitis with involvement of the peritoneum, and a case of mitral stenosis, in which extensive hæmorrhage had taken place, as a result of embolism of the middle cerebral artery.—Dr. NEWMAN showed a new form of portable secondary battery for the simultaneous use of electric light and cautery.—Dr. J. WALKER DOWNIE showed a substance (crayon de Buét) which, when rubbed on a laryngeal mirror, prevented the deposition of moisture.

Glasgow Pathological and Clinical Society, *March* 10, 1902.—Mr. H. E. **Clarke**, President, in the chair.—Dr. C. **Workman** described the features of, and showed microscopical sections from, two cases of malignant tumour of the pancreas, and from a case of general malignant infiltration of the peritoneum. Of the first two, one was a sarcoma of the mixed-cell type, and the other an adeno-carcinoma of the tail of the pancreas. The third Dr. Workman was inclined to set down as an endothelioma; the primary focus of the disease could not be determined.—Mr. **Maylard** showed a specimen of "hour-glass" contraction of the stomach with stenosis of the pylorus, due to extensive ulceration. The case illustrated several points of particular interest in regard to diagnosis and operative treatment.—Dr. J. M. **Kerr** showed seven specimens illustrating malformations of the fœtus. The conditions were as follows—(1) Anencephalia, (2) cyclopia; (3) spina bifida and retroflexion of the body and fissura abdominalis; (4) extreme retroflexion of the head and body resembling the iniencephale of St. Hilaire; (5) amnionic adhesions, protrusion of heart, liver, intestines, and encephalocele; (6) four-limbed acardiac acephalic monster; (7) perobrachius.

ANALYTICAL REPORTS.

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NEW TABLOIDS.

(Burroughs, Wellcome, & Co., London.)

1. MORPHINE AND EMETINE. 2. SODIUM CACODYLATE. 3. QUININE AND CAMPHOR. 4. QUININE, BELLADONNA, AND CAMPHOR. 5. HYDRARGYRUM PERCHLORIDE AND POTASSIUM IODIDE. 6. ASPIRIN. 7. HYOSCINE COMPOUND (HYPODERMIC), A. AND B. 8. ATROPINE SULPHATE (OPHTHALMIC). 9. ALUM (OPHTHALMIC).

THE above are the latest additions to Messrs. Burroughs, Wellcome, & Co.'s well-known Tabloid Series. Coming from such a source, there is no need to question the accuracy of dosage or the pharmaceutical skill displayed in these products. It will be enough to give a note of their several strengths—

I.

Morphinæ sulphatis . . .	$\frac{1}{40}$ gr.
Emetinæ	$\frac{1}{80}$,,

One dissolved in the mouth.

II.

Sodii cacodylatis .	$\frac{1}{4}$ gr. (0·016 grm.)

One increased to four, swallowed with water. Also the same for hypodermic use, gr.

III.

Quininæ bisulphatis . . .	1 gr.
Camphoræ	$\frac{1}{8}$,,

One to five.

IV.

Quininæ sulphatis . . .	$\frac{1}{4}$ gr.
Extracti belladonnæ . . .	$\frac{1}{8}$,,
Camphoræ	$\frac{1}{4}$,,

One to four.

V.

Hydrargyri perchloridi . .	$\frac{1}{16}$ gr.
Potassii iodidi	5 grs.

One dissolved in large glassful of water after food.

VI.

Aspirin	5 grs.

One to three.

VII.

	A.	B.
Hyoscinæ hydrobromidi	$\frac{1}{100}$ gr.	$\frac{1}{100}$ gr.
Morphinæ sulphatis .	$\frac{1}{8}$,,	$\frac{1}{4}$,,
Atropinæ sulphatis .	$\frac{1}{180}$,,	$\frac{1}{150}$,,

VIII.

Atropinæ sulphatis . . .	$\frac{1}{500}$ gr.

IX.

Aluminis	$\frac{1}{250}$ gr.

These tabloids readily break up or dissolve in water, and their formulæ are well devised for the several purposes in view. In Number 5 the excess of iodide promotes rapid solution of the tabloid; the danger possibly attendant upon the entrance of a tabloid *en bloc* into the stomach, and the localised dissolution thereof, doing injury to the gastric mucous membrane about the spot of its deposition, is guarded against by advising solution before swallowing. The warning hardly seems strong enough; antecedent solution should be very clearly insisted on.

PURE CHLORIDE OF ETHYL.

(Société chimique des Usines du Rhone, Lyons.)

An exceedingly neat little glass cylinder of chloride of ethyl, for local refrigeration, comes from the Société chimique des Usines du Rhone, fitted with the lever stopcock introduced a short time ago in place of the metal screw-cap previously employed. Kélène (from *κήλεω*, "I calm"), as the French have it, provides us, undoubtedly, with a most useful and valuable means for the production of local anæsthesia by cold, apart altogether from the general anæsthetic value of its vapour; and a veritable godsend in many of the minor surgical operations on children. But these merits are already widely known, and it only remains for us to draw attention to the fact that pure chloride of ethyl can be obtained in small tubes,—sufficiently large, however, for any one case, if not for many,—more suited for carrying about in pocket or bag than the cylinders usually met with.

LIQUOR COLCHICINÆ SALICYLATIS (HOPKINSON).

(Baiss Brothers & Stevenson, London.)

The preparation of salicylate of colchicin, known as Hopkinson's, and manufactured by Baiss Brothers & Stevenson, has now been before the medical public for some little time. It contains in each drm. $\frac{1}{32}$ gr. of the salicylate, in complete solution; the dose, 1 drm. diluted, twice daily, between meals. It is recommended in all gouty and chronic rheumatic affections, in place of colchicum, on account of its diminished tendency to cause gastric and intestinal irritation, so common after the exhibition of colchicum in other forms; while the salicylic element also has a share in the result effected. From personal observation, we can testify to the truth of these statements. The liquor affords a very satisfactory means for the administration of the active principle of colchicum in suitable cases.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,

MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING FEBRUARY 22, 1902; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees. Above 42°	Accumulated Day-Degrees. Below 42°.	Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
Mean	37°·6	*[1] 36° [2] 66°	164° 332°	2·4	4·9	62	99	2°·8
Observed	30°·4	[1] 0° [2] 39°	324° 435°	0·7	2·6	68	98	2°·3
Difference	−7°·2	[1] −36° [2] −27°	+160° +103°	−1·7	−2·3	+6	−1	−0°·5

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING FEBRUARY AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1251 [2] 2585	208·2 215·3	225 451	37·6 37·6	109 237	18·2 19·6	293 605	48·8 50·2	132 278	21·9 23·1
Actual Deaths and Rate per 10,000	[1] 1266 [2] 2456	210·6 204·6	250 476	41·6 39·6	150 299	24·7 24·9	271 521	45·4 43·8	125 246	20·8 20·5
Difference from Mean	[1] +15 [2] −129	+2·4 −10·7	+25 +25	+4·0 +2·0	+41 +62	+6·5 +5·1	−22 −84	−3·4 −6·9	−7 −32	−1·1 −2·6

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 70 [2] 152	11·7 12·6	31 60	5·2 4·8	104 218	17·3 18·2	118 228	19·6 19·9	52 106	8·6 8·8
Actual Deaths and Rate per 10,000	[1] 80 [2] 156	13·4 13·0	39 72	6·6 6·1	118 243	19·6 20·4	110 205	18·3 16·8	69 130	11·5 10·3
Difference from Mean	[1] +10 [2] +4	+1·6 +0·3	+ 8 +12	+1·2 +1·3	+14 +25	+2·3 +2·2	− 8 −23	−1·3 −2·1	+17 +24	+2·9 +1·5

NOTE.—The figures [1] denotes the data for February, [2] for year to date.

February, or rather the four weeks ending on February 22, presented a very marked decrease in mean temperature; the deficit of 7°·2 for the four weeks owes much to the week ending February 1, really belonging to the month of January. The mean temperature for this week in the East of Scotland was as much as 11° below the normal. During the four weeks no day-degrees of warmth over 42° were experienced; a deficit equal to 36 day-degrees; while 160 of day-degrees below 42° were registered in excess of the normal, or + 97 per cent. The rainfall was very deficient, only amounting to less than one-third of the usual; the number of hours of bright sunshine was above the average; the daily variability of temperature below it.

During the first two months of 1902 there has been a lack of warmth and an excess of cold; only about one-half of the average rainfall, and practically the normal number of hours of sunshine.

The total number of deaths recorded in the four towns was somewhat over the average; constitutional, circulatory, digestive, urinary, pneumonic, and cancerous causes contributing to this. The deaths from respiratory diseases, as a whole, and from nervous and phthisical causes, were lower than expected. Influenza caused twenty deaths directly.

The first two months of 1902 show a lessened mortality; especially decreased rates under respiratory, nervous, and phthisical diseases; while circulatory, pneumonic, and cancerous causes exhibit considerable increases. The values for pneumonic deaths, both for January and February, have shown increases, although the similar total respiratory values were below the average; a divergence noticed frequently in this column on previous occasions. Deducting from the respiratory the pneumonic deaths, the rate of the remaining respiratory cases is about 19 per cent. below the average of recent years.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

The Town Council and Bacteriological Diagnosis.

THE unfortunate controversy between the Town Council and the medical profession of Edinburgh has ended in a way which reflects but little credit upon the former, whether as regards common sense or common courtesy. For nearly sixteen years the Royal College of Physicians, alone at first, but latterly with the generous assistance of the Royal College of Surgeons, has carried out the entire work of bacteriological diagnosis for the City of Edinburgh. During the first thirteen years this was done entirely at the cost of the College, but, since the beginning of 1900, the Town Council, on the suggestion of its Public Health Committee, then under the guidance of the late Mr. Pollard, defrayed the actual cost of investigation, the annual sum given by the Council to the College being in round figures about £120 per annum, for reports on diphtheria, tuberculosis, and typhoid fever. Last year the Trustees of the Usher Institute of Public Health approached the Town Council with a view of securing for the Institute the bacteriological diagnosis of disease within the City, and a series of bids was made by them in order to supplant the College of Physicians. At first they proposed to do the work at the rate of £500 for the first thousand specimens; this offer was followed by another reducing it to £400, and latterly this was again revised and the sum lowered to £300. Such a spectacle of haggling would be ludicrous if it were not humiliating to those concerned in it.

The Royal College of Physicians, in desiring the continuance of the existing system, contented themselves by pointing out to the Town Council the history of the work done by the College Laboratory, and the fact of its wide recognition as a centre for scientific research; they indicated, however, their willingness to send representatives to meet with the Town Council or its Public Health Committee in order to discuss the matter. The Public Health Committee, under the chairmanship of Mr. Lang Todd, recommended, we are glad to mention, the continuance of the arrangement with the College.

At this point the members of the medical profession of Edinburgh expressed their views with no uncertain sound. At a meeting, convened at the request of the practitioners of Edinburgh by the Presidents of the two Colleges, a resolution was unanimously adopted requesting the Town Council to continue the arrangement with the Royal College of Physicians. Nevertheless the Town Council, at the meeting of 10th March, by a majority of eighteen declined to entertain the report of the Public Health Committee in favour of retaining the present arrangement, and decided to accept the offer of the Trustees of the Usher Institute of Public Health.

The medical practitioners of Edinburgh again met on 18th March, and for the second time unanimously adopted a resolution in favour of the *status quo*, in the following terms:—

"That this meeting of the medical practitioners of Edinburgh, called under the auspices of the Edinburgh Branch of the British Medical Association, views with great regret and dissatisfaction the decision arrived at by the members of the Town Council, in opposition to the recommendation of the Public Health Committee and the expressed wishes of the medical profession, as to the bacteriological diagnosis of infectious diseases; and resolves that steps be taken to bring the views of the profession on this subject before the members of the Town Council individually, by deputation, and by circular letter."

In accordance with this resolution, a deputation met with the Town Council on 25th March, and strongly emphasised the views of the practitioners of the district. A warm discussion took place in the Town Council upon the subject, but in the end the minutes of the previous meeting were adopted by a majority of three. As some misrepresentations and misstatements were made by certain of the town councillors as to the voice of the medical profession, a plebiscite of the practitioners of Edinburgh was undertaken by the Edinburgh Branch of the British Medical Association. As the result of this, a statement was submitted to the Town Clerk in favour of the existent arrangement, signed by 273 out of the 308 medical practitioners within the City of Edinburgh. Notwithstanding this, on 9th April the minutes of the Council were, for the second time, finally approved,—this time, however, by the narrow majority of one. It is well known that five absentees were in favour of retaining the arrangement with the College, but for one reason or another they did not show the courage of their inclinations if not convictions. It has been further ascertained that, up to the time of going to press, the Town Clerk has not had the courtesy to communicate the decision of the Council to the College of Physicians.

The decision of the Town Council is from every point of view deplorable. In opposition to the practically unanimous wish of those who practise medicine in Edinburgh, in defiance of the organs of public opinion within the city, and in spite of the recommendation of the Public Health Committee, the Town

Council has without any excuse departed from the arrangement only recently eulogised by the Medical Officer of Health as working most harmoniously for the good of the citizens. The laboratory of the Royal College of Physicians was expressly founded for the diagnosis of infectious diseases, as well as for the prosecution of original research. The Institute of Public Health, so far as can be made out, is intended to be a great teaching centre. The experiment which is now about to be made not merely interferes with the purpose of the College laboratory, but it threatens to inundate the Usher Institute with a mass of work which can be no part of the duty of a teaching institution.

These, however, are but insignificant in comparison with the evil which has been and will be wrought by the ill-considered action of the Town Council. The members of the medical profession have laboured in season and out of season for the public weal in matters of health. By their labours in the past they have established a right to be heard, and when a deaf ear is turned to them in a matter of such importance, it cannot fail to destroy the mutual confidence between the practitioners and their civic rulers.

Chemistry and the Medical Curriculum.

SOME of the alterations suggested regarding the introductory science subjects of the medical curriculum are to be viewed with concern, if not with alarm. This applies with special force to chemistry, which some reformers would like to see reduced to a three months' course, or merely included in the preliminary examination. At present, medical students attend a five months' lecture course along with a three months' practical course. In that time it is barely possible to ground them in the principles of the subject and give them an outline of some of the more elementary applications of the science. In many cases the first year's student looks upon a knowledge of chemistry as a perfectly useless acquirement, except in so far as it enables him to surmount the first barrier placed between him and a degree. He therefore studies the subject simply from the examination point of view, and, the first professional safely passed, promptly loses the greater part of what little knowledge he has acquired. Later, when he has to devote his attention to materia medica and to physiology, he begins to realise that chemistry does play an important part in the professional branches of his work, and that a knowledge of it is not only desirable, but is necessary for the intelligent study of many of the problems presented by the phenomena occurring within the animal organism. In physiological chemistry we have the most complicated of all the various subdivisions of the science, presenting great difficulty even to the trained chemist. The idea that the general introduction of chemistry into schools would greatly diminish the task of the universities in this respect, so far has not been justified in the least; the reverse rather is the case. The average schoolboy apparently looks upon chemistry lessons as a source, not of instruction, but simply of entertainment; he nevertheless comes to the university under the impression that he already knows all that is necessary and need not attempt to learn more; in the practical classes he not only neglects his proper work for futile independent experimentation, but endeavours to constitute himself demonstrator to his neighbours, frequently with unfortunate results. Hence the very general experience that such scholars form worse students of chemistry than those who make their first acquaintance with the science after they have left school. There are many exceptions, of course, but the type referred to is a painfully common one. If medical students generally could be made to realise at the beginning of their course that they should study chemistry as a subject which would be of great use to them in their professional studies, it would be an advantage in every way, even from the examination standpoint. In one of the university examinations in chemistry last year, nearly one-half of the medical candidates failed to pass; among the Arts candidates the proportion was about a third; while among the Science candidates only about a fourth were unsuccessful. These students all took the same classes and examinations, and were examined by the same standard; the differences in the results are striking.

The Inebriates Amendment Bill for Scotland.

The existing legislation for inebriates in this country is not satisfactory. Whatever the intentions of the framers of the recent Act may have been, the results have been singularly ineffectual. The State Reformatory at Perth has been but little taken advantage of, and the directors of the Glasgow Municipal Reformatory, in a recent report, deplore the fact that "curable" cases are conspicuous by their absence from that institution. In order to qualify for treatment in these institutions, the law requires that a person should have been four times convicted within a year, or have committed some serious offence while under the influence of drink. These enactments necessarily insure that, as a rule, only the hardened and depraved drunkard, in whose case reform is always dubitable and generally impossible, can be reached. The amendment recently introduced into the House of Commons by Sir John Batty Tuke involves an entirely new principle. It permits inquiry by a judge or sheriff (at the instance of a relative, or, in the case of a person of limited means, of the inspector of poor of a parish) into charges of habitual inebriety against an individual, and, upon satisfactory evidence, the committal of the person against whom such charges are made to an institution for care and treatment. If we are to have curative legislation for the inebriate at all, these are the lines upon which it must proceed. Whether the times are ripe for such a drastic measure is another question.

The New Lunacy Bill for the State of New York.

NOTWITHSTANDING opposition on the part of philanthropists, clergymen, physicians, and the press, a Bill has just passed through the Legislative Assembly of the State of New York, abolishing the local governing bodies of asylums, and substituting for them visiting committees devoid of any control. The whole executive power is by this Bill placed entirely in the hands of the State Commissioners in Lunacy. The opponents of the Bill argued, with truth, that the asylums of the State are second to none in the world, and that there is therefore a danger that they may, under the new régime, retrograde from that honourable position. They also point out that the members of the Lunacy Commission are dependent for their position on political parties, and that there is every probability that corruption may steal in along with political preferment. The arguments of the promoters are based upon economy and upon the hypothetical advances in treatment and care which an independent body of specialists can impose at will. The operation of the new Act will be keenly watched, for nowhere has lunacy administration passed more crucially through the experimental laboratory than in New York State.

Professor Agassiz in Edinburgh.

THE recent visit of the great American zoologist to Edinburgh will not be soon forgotten amongst local scientists. Of an easy and graceful address, Professor Agassiz held the close attention of a very large gathering of the Royal Society of Edinburgh for about an hour and a half. It is not often that one can hear at first-hand the conclusions to which a scientist has been led after an experience extending over fifty years of unremitting toil. On the formation of coral reefs he was precise to a degree, and apparently we must now definitely relegate the fascinating theory of Darwin to its place amongst the things which might have been but which are not.

In the evening, Professor Agassiz, at the Royal Society Club, made some interesting statements in respect to the Carnegie Endowments in America. So far as we could gather, any scientist who had something to investigate, something to find out, might reasonably look to this endowment to remove all pecuniary difficulty from the attainment of his object. Here we are going to teach the Carnegie student the possibilities that are in him; let us hope that, like our American cousins, we may also be able to place in his power the development and the application of them.

The Influence of the Edinburgh School.

WHATEVER opinions may be held with regard to the popularity of the Edinburgh Medical School, it is an admitted fact that no other university has provided anything like the same number of teachers in medical schools elsewhere.

A recent visit to Liverpool afforded us an opportunity of inspecting the new botanical department there. This institution, which is the outcome of the energy and industry of Professor Harvey Gibson, is one of the best equipped of any of the new laboratories which we have recently seen. Without being lavish, Professor Gibson's new building is admirably furnished with every convenience for facilitating instruction and research.

In a city which is remarkable for the munificence of its benefactors, it is not surprising to find other evidences of the activity of Edinburgh men. Professor Paterson has just completed the erection of an anatomical department, in which the best traditions of the Edinburgh School of Anatomy are maintained, and in which, too, we find evidence of the professor's originality.

Nor is Liverpool alone in the possession of teachers of Scotch training. At Owens College, Professors Young, Stirling, and Delépine are largely responsible for the scientific training of the Victoria undergraduates in medicine, whilst the youngest of our English universities has recently acquired the services of Professors Carlier and Leith. With money to back them, we have reason to believe that there will be developments of a kind in Birmingham which will still further enhance the reputation of the Edinburgh school.

The influence of our Alma Mater, however, is not confined to the younger universities. At Cambridge there is Sims Woodhead with a big pathological laboratory on hand. At Oxford, Haldane, Ritchie, and Thomson have each made their mark; whilst the Durham School of Medicine owes much to the ability and guidance of its professor of anatomy, Robert Howden. From which it follows, that though there may be truth in the assertion that, so far as the number of graduates is concerned, our influence is on the wane, it would appear that, as regards the extension of our educational methods, that influence, at present, might almost be said to be paramount south of the border.

Hospital Ships.

THE hospital ship *Maine* has completed her second voyage from the Mediterranean, bringing home some eighty or ninety invalids to Haslar. Our readers are doubtless familiar with the past history of this vessel when she was under the charge of Lady Randolph Churchill and a committee of American ladies, but many are not aware that, through the generosity of Mr. Bernard Baker, chairman of the Atlantic Transport Company, she was handed over as a gift to the British Government.

During the past year the Admiralty have employed her as a hospital ship attached to the Mediterranean Squadron, and the experiment has been so far successful that similar ships are likely to be provided for the navy as a whole. The *Maine*, which is under the charge of an old Edinburgh graduate—Staff-Surgeon W. M. Craig—may be taken as a type of what hospital ships are likely to be. The senior surgeon on board is responsible for everything except the navigation of the ship, which is entrusted to officers and men of the mercantile marine, since the Admiralty are not in a position to spare the services of naval officers and bluejackets on a non-combatant ship. The hospital ships will follow the squadron, and, in times of peace, will take charge of all accidents and cases requiring operation. Concerning medical cases, apart from those which are diagnosed or are becoming chronic, the rule is, we understand, to transfer a man to the hospital ship whenever his temperature reaches 102°. In this way all the more serious cases are removed from the ships of the squadron, a gain to the patient which the civilian can hardly appreciate. In this connection it may be pointed out that the noise on board a battleship, when gun and other forms of drill are going on, is most trying. Such difficulties are overcome by transference to the hospital ship, where not only is provision made for their comfort, but they are removed from all the disturbing influences present in every fighting ship. Besides the duty of bringing home invalids from time to time, these ships may also be employed as convalescent homes, for experience has proved that patients suffering from Malta fever often make little progress as long as they are retained in hospital on shore, but rapidly recover when taken for a short cruise. With so much to be said in their favour, even in times of peace, it will not be surprising to find the number of these ships largely increased in the near future.

Le Feuilleton Medical.

THE French are a queer race. Their novels, their short stories, the journalistic fare served them from day to day, seldom lack some hot-spiced sexual *indélicatesse*, strongly expressive and boldly suggestive. In France such topics apparently are thought to be correct and proper; sexual peccadilloes and escapades the most interesting of subjects to read about. Still, it is somewhat surprising to find that this liking for sexual tit-bits is shared by some at least of the medical men of France. A few of the well-known medical journals regularly include in their columns a *feuilleton*, in addition to the more common professional items. The favourite subject of these *feuilletons* is illicit or unnatural love and its results.

Taking a few examples, at random, from recent numbers, there are to be found a series devoted to Catherine of Russia, her libidinousness and sexual psychopathy; an article detailing the unnatural behaviour of a bright ornament of the aristocracy of France one or two centuries ago, dug up from out some of the prurient writings of his time; a notice of a defunct bantling of the press issued in 1761, and this only because of the opportunity given for the reproduction of two suggestive letters contributed to (or manufactured for) its columns; an old Latin enigma in verse, with the French equivalent of the grossest nature; prostitutes, prostitution; the laws of tolerance and supervision *cum multis aliis similibus.*

How dirty details, lucubrations upon loose living and peccancies of love, the unearthing of immoral *objets d'estime* of the past, can under any circumstances be incorporated with the science of medicine, is only known to a Frenchman. Illustrative cases, no doubt, of sexual perversion, etc., are frequently included in various books and articles concerned with psychopathology; but only *pro re natâ*. In these *feuilletons* no object is apparent save the titillation of the reader's desire; the inducement to subscribe conveyed to them by combining "fornication and other deadly sins," dressed in all the nakedness of science (rather of pseudo-science), dispassionately discussed with professional subjects.

In truth, the supposed, and probably—for where smoke is fire is—real desire for prurient details, under the pretext of scientific purity, constitutes a deplorable feature of certain of the French medical papers. Doctors surely have enough to do with dirt of all kinds, in the pursuit of their professional duties, without having need of meeting the same in unprofessional guise.

Treatment of Lupus.

THE managers of the Royal Infirmary have recently made an important addition to the department for diseases of the skin, by setting aside a special room for the electrical treatment of lupus and rodent ulcer. The 10-inch X-ray coil, which has for nearly two years been in operation, has now been transferred thither from the general electrical department, and several cases of rodent ulcer have been cured and others materially benefited by the combined action of the rays and other suitable applications. One of the Lortet and Genoud lamps, as manufactured and modified by Marshall & Woods, London, has been placed in position. This is a simplification of the large and expensive apparatus for utilising the actinic rays, so successfully introduced by Professor Finsen of Copenhagen. By it the source of light is brought very close to the surface to be acted on, and so, while the arc itself is less brilliant, its proximity correspondingly intensifies the effect. By means of a circulating water-jacket, heat is wholly eliminated, and this is supplemented by employing lenses of rock crystal, which filter out the red beams of the spectrum. The necessary blanching of the tissue is obtained by the patient herself pressing the part against the lens, flat or convex, to suit the contour. The time occupied for each exposure is less than a fourth of that required by the large Finsen lamp, and the amount of electricity consumed is very small. It is calculated that about one shilling per hour will cover the cost of working, or about threepence for each patient, so far as current is concerned. The reactions obtained have been well marked in most instances. The treatment is necessarily slow, but proceeds on the right lines—that of destroying the bacillus itself, so intimately connected with the origin of lupus, but other and older methods can be advantageously associated with that by light.

ORIGINAL COMMUNICATIONS.

THE SUBMUCOUS AREOLAR TISSUE OF THE LARYNX, AND ITS SIGNIFICANCE IN THE SPREAD OF ŒDEMA.

By A. LOGAN TURNER, M.D. (Edin.), F.R.C.S.Ed., *Surgeon for Diseases of the Ear, Throat, and Nose, Deaconess Hospital, Edinburgh.*

(PLATES VI.–IX.)

THE subject of œdema of the larynx has been brought somewhat prominently before my notice by the opportunity recently given to me by my friend, Dr. Harvey Littlejohn, of studying a fatal case of this condition. The sudden onset of acute œdema producing symptoms of a grave nature, which may terminate in death, is an occurrence of sufficient surgical importance to merit more than a passing notice being given to its consideration. Indeed, a rapidly developing œdema in this region must be regarded as a matter of vital importance, and the possibility of its sudden fatal termination should always be kept in mind. Cases are reported in which death has taken place from asphyxia, not only within a few hours, but within a few minutes of the first onset of symptoms of dyspnœa.

From a perusal of the text-books and monographs dealing with œdema of the larynx, it is evident that various classifications have been adopted by different writers. It is not my intention to enter into this part of the subject. It is sufficient for our purpose to bear in mind that œdema of the larynx is merely an objective clinical phenomenon, and not a disease. It consists in a fluid exudation into the loose submucous areolar tissue, and it may be of a simple serous or of a sero-purulent character. The loose connective tissue is present to a greater or less extent in different parts of the larynx, and the object of this paper is to demonstrate the arrangement of this tissue and to point out its clinical significance.

Œdema of the larynx may be either inflammatory or non-inflammatory in origin, the former being by far the more frequent; it may be secondary to previously existing disease in the larynx, or it may arise in connection with inflammations at the base of the tongue and in the fauces and pharynx, while more rarely it may result from an inflammatory process arising in the cellular tissue or glands of the neck. The non-inflammatory form may occur as a local manifestation in renal and cardiac disease, or it may result from obstruction of the veins of the neck, produced by various causes.

The three following cases present some features of interest, and serve as a suitable introduction to the more anatomical portion of the paper:—

CASE 1.—The patient, J. A., æt. 34, a stone-mason to trade, had apparently enjoyed good health until the onset of his present illness. In the early part of 1899, he began to suffer from slight hoarseness of voice, and in the month of April of that year he sought special advice. It is unfortunate that no facts concerning the local appearances then observed in the larynx are obtainable, nor is there any reliable information to be had concerning the progress of the patient during the following summer. His friends, however, were under the impression that he suffered from "consumption." On the morning of Monday, September 4, 1899, about six months after the examination of the larynx had been made, the patient suddenly died. The facts regarding his condition immediately prior to his death, as related by his friends, are briefly as follows:—Up to and upon Friday, September 1, he was able to carry on his work as a mason in the neighbourhood of Edinburgh, apparently without personal inconvenience. On the following day (Saturday) he came into town with the object of paying a visit to the Royal Infirmary on the Monday following. He appeared to be in fairly good health and spirits, complaining of nothing save hoarseness. During Sunday night, however, for the first time, his rest was somewhat broken by occasional attacks of difficulty in breathing. At breakfast on Monday morning he did not feel well, but expressed himself as quite able to go out. Within half an hour of breakfasting, the patient was dead, a sudden and severe attack of dyspnœa having supervened, death from asphyxia taking place before any surgical assistance could be obtained.

A post-mortem examination was made by Dr. Harvey Littlejohn, who has kindly furnished me with the following short note of the general appearances which presented themselves:—The body was fairly well nourished; the heart was normal; the left pleural cavity showed some old adhesions, and in both lungs there was evidence of tuberculous disease, although in neither was there a cavity present. The liver, spleen, and kidneys were normal. The brain was not examined.

The larynx presented the following features of interest (Plate VI. Fig. 1):—The upper aperture was almost completely occluded by great tumefaction, so that in the recent state a probe could only be passed with some difficulty downward into the interior of the larynx. The swelling and consequent occlusion was due to an œdematous infiltration of both ary-epiglottic folds, and of the mucous membrane covering the arytenoid cartilages. In the latter situation the œdema extended downwards for some little distance upon the posterior surface of the two cartilages, its lower limit reaching as far as the upper part of the posterior surface of the cricoid cartilage. On each side the swelling extended outwards from the ary-epiglottic folds into the pyriform sinuses, while mesially the inner surfaces of the two folds lay in contact.[1]

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[1] This larynx was shown at the meeting of the Laryngological Society of London in May 1900.

In this way the respiratory channel was so completely occluded that the ventricular bands and the true vocal cords, with the intervening glottic chink, were invisible from above. The epiglottis maintained its normal appearance and contour.

In order to ascertain the condition of the interior of the larynx, it was necessary to divide the posterior wall vertically. Examination then revealed the presence of an ulcer of considerable size upon the mesial aspect of the left ary-epiglottic fold, and also upon the left ventricular band. The left true cord was destroyed throughout almost its entire length, while a small granulation formed an excrescence close to its posterior extremity. The right true cord also showed evidence of some superficial ulceration. There was no glottic or subglottic œdema.

Although I was unable to discover the presence of the tubercle bacillus in a small piece of tissue removed from the edge of the ulcer situated upon the left ventricular band, the history of the case, the macroscopic appearances of the larynx, and the associated pulmonary condition, sufficiently established a diagnosis of laryngeal tuberculosis. Death, undoubtedly, was due to asphyxia resulting from a rapid serous exudation, which produced sudden and marked œdema of the loose submucous connective tissue in the ary-epiglottic folds and over the arytenoid cartilages.

The case, thus somewhat briefly recorded, presents certain features of considerable interest. A localised *chronic* œdema, occurring in cases of laryngeal tuberculosis, is, as we are aware, by no means infrequent; indeed, it is a common manifestation in that disease. We have no reliable information regarding a previously existing chronic œdema in this case, as no examination of the larynx had apparently been made for some considerable time before death. The mere fact, however, that the patient was able to carry on his work and move about up to the last, without any apparent respiratory trouble, sufficiently justifies us in concluding that there was an absence of any marked swelling from that cause. On the other hand, the sudden onset of great dyspnœa points to the development of an *acute* œdema, which more or less completely occluded the respiratory passage, and rapidly terminated in death. It is possible that some slight œdema of a chronic nature was already present, and that a sudden acute exacerbation supervened upon it.

It is necessary, therefore, to bear in mind the possibility of so grave a complication arising in the course of laryngeal tuberculosis. While it is a well-recognised fact that acute inflammatory œdema may develop in a larynx affected with tuberculous, syphilitic, or cancerous disease, some diversity of opinion apparently exists amongst different authorities as to its frequency. Trousseau[1] states that œdema of the larynx is the most frequent termination of laryngeal ulceration. In tuberculous cases, he says, death results from œdema before the last stage of marasmus is reached, but it is not apparent whether he implies that it is usually of such a nature as to bring about a sudden termination, as in this case. A perusal of the cases of acute œdema, reported during the last ten to fifteen years, leads one to conclude that in tuberculous ulcerations, at any rate—and it is this disease which we are at present considering—a fatal complication of this nature is comparatively rare. The study of the literature of this subject has been greatly facilitated by the publication of an interesting paper by Clarence Rice of New York.[1] This writer has tabulated a series of forty-one cases of acute œdema, as reported in the journals during the decade 1887 to 1897. In twenty-two instances, or in one-half of the cases, the dyspnœa is described as being of a severe or of an acute suffocative type. Of these, six died during the acute attack, while three other cases proved fatal, but not apparently from asphyxia. In the remaining thirteen cases, in which the respiration was seriously interfered with, recovery took place. If we examine into the possible etiology, not only of the twenty-two acute cases, but also of the remaining nineteen, of a rather less severe nature, we find that tuberculosis of the larynx is described as only being present in one instance, and in this case the exciting cause of the œdema was stated to be iodide of potassium. In one other case, where the œdema produced an acute suffocative dyspnœa, the patient, who was suffering from laryngitis, was described as being "a tuberculous subject." This fact must, however, be kept in mind in studying the tables published by Rice, that in many instances merely the term "catarrhal" is employed to describe the pre-existing laryngeal condition. In the absence of more definite information on this point, we cannot, of course, altogether exclude the possibility of the catarrh being of a tuberculous nature. Since the publication of Rice's paper, I have been able to obtain reference to fourteen additional cases of severe dyspnœa from laryngeal œdema, published previous to 1902, and in none of these was tuberculous disease of the larynx present. These facts would tend to show that the rapid onset of severe dyspnœa, terminating in sudden death, or necessitating the immediate performance of tracheotomy, is not a common complication of laryngeal tuberculosis. The case here recorded and figured must therefore be regarded as one of comparative rarity.

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[1] "Clinical Medicine," vol. iii., *New Syd. Soc. Translation.*

CASE 2.—A male, æt. 49, presented himself at Dr. M'Bride's department in the Royal Infirmary, on May 8, 1896, with the history that on the previous day his throat had commenced to give him pain. Up to that time he had enjoyed good health. The pain was considerably aggravated on swallowing, and he experienced the sensation as if a foreign body was in the throat. He had no dyspnœa or hoarseness, the voice remaining unimpaired. The patient's general condition was fairly good.

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[1] *Trans. Am. Laryngol. Soc.*, N. Y., 1898.

On examination, the fauces and pharynx presented a normal appearance. With the laryngoscopic mirror, however, the epiglottis was seen to be of a bright red colour, greatly swollen and rigid, and from its size and rigidity practically obliterating any further view of the larynx. So far as could be ascertained, the inflamed œdematous condition of the mucous membrane appeared to be localised to the anterior aspect of this structure, and the absence of dyspnœa and any impairment of the voice pointed to the fact that the inflammation had not attacked the upper aperture or the interior of the larynx. The swollen epiglottis was scarified with Heryng's knife, and the patient very soon began to feel relief from his symptoms. On the following day the redness and swelling had somewhat subsided, and the condition continued to improve from that date. When examined again with the mirror at the end of three weeks, the epiglottis was found to have regained its normal contour.

To this condition the term *angina epiglottidea anterior* has been applied. In all probability the infection takes place through the lingual tonsil at the base of the tongue, and the inflammation invades the area lying between the tongue and the epiglottis. Owing to the presence of a quantity of loose submucous cellular tissue in this region, a considerable serous exudation takes place, and œdema of the anterior aspect of the epiglottis is rapidly formed. In this case the first symptoms were only complained of on the previous day. In the concluding part of the paper these points will be considered in greater detail.

Case 3.—The third case also presents certain features of considerable interest, and may be studied in conjunction with that just narrated. J. F., a policeman, æt. 22, complained on the morning of January 31, 1900, of a sore throat, which caused him some pain on swallowing. He experienced no difficulty in breathing at this time. He remained out on duty all day in severely cold weather. In the evening he experienced for the first time slight difficulty in respiration, and on the following day he remained in bed. During the night of February 1, severe dyspnœa supervened, producing marked cyanosis, the members of his family describing him as becoming "black in the face." On the following morning he was seen by Mr. Alexis Thomson, to whom I am indebted for the description of his condition. He was found speechless, perspiring, and in great distress, his inspirations being of a noisy stridulous character. His pulse was full and bounding; the temperature was 100° F. There was nothing to be felt on external palpation of the neck. With the aid of a spatula a mass of a livid hue was visible at the base of the tongue. With the laryngoscopic mirror the epiglottis and ary-epiglottic folds were seen to be enormously swollen and partially occluding the upper aperture of the larynx. The true cords were only seen with great difficulty on attempted phonation.

The treatment adopted consisted in scarifying the epiglottis and ary-epiglottic folds with scissors, after spraying with cocaine. A large poultice was applied to the neck, and a steam spray and tent erected. There was free bleeding and expectoration, and considerable relief was obtained in a few hours. Compound jalap powder was administered. On the following day the breathing was much easier, there was no crowing inspiration, and the patient was able to swallow and speak without much difficulty; the œdema had considerably subsided. Examination of the urine at this stage showed an acid reaction, specific gravity 1035, some albumin, and a trace of blood; also urates and granular and hyaline casts.

I had an opportunity of examining the patient on February 28. He was then in good health; the larynx showed no œdema, infiltration, or ulceration; but there was a slight redness of both vocal cords. The urine was normal. It is evident both from the history given in this case, and from the local appearances observed, that the inflammation commenced in the region of the fauces. The sore throat and pain on swallowing were the first symptoms complained of, and the objective examination disclosed an acute œdematous inflammation of the region immediately in front of the epiglottis. At a later stage, difficulty in breathing supervened, undoubtedly consequent upon the infiltration of the ary-epiglottic folds, which partially occluded the upper laryngeal aperture. In this case, therefore, in all probability, the inflammatory process had spread downwards so as to involve the larynx proper.

THE ANATOMICAL ARRANGEMENT OF THE SUBMUCOUS AREOLAR TISSUE OF THE LARYNX.—The development of inflammatory œdema of the larynx is, in the majority of cases, dependent upon three main factors,—First, upon the intensity of the inflammatory process producing it; secondly, the site of the infection; and, thirdly, the anatomical arrangement of the loose submucous cellular tissue of the larynx. It is to a study of the second and third conditions, and especially to the last named, that we now wish to draw the reader's attention. As œdema is essentially a serous exudation into the submucous areolar tissue, it naturally follows that the extent of the swelling thus produced, and the degree of development which may be attained by it, must depend both upon the limitations and upon the amount of such tissue in any given area. This loose cellular tissue varies somewhat in amount in different parts of the larynx, in certain areas being very considerably developed, in others being sparse and thin, while in other situations again, septa or partitions of a denser nature are met with, which appear to demarcate these areas the one from the other: in other localities again it is absent. We find that these anatomical facts have their clinical counterpart in the cases of œdema of the larynx that are from time to time met with, the exudation being sometimes small in amount or reaching very considerable proportions, in some cases being localised, in others being more or less diffuse.

In 1852, Sestier, in his classical work,[1] demonstrated upon the cadaver the importance of studying the arrangement of the submucous areolar tissue in different parts of the larynx. One of the methods adopted by him for this purpose consisted in peeling off the mucosa, and defining the different areas in which this could be accomplished readily or with difficulty. In more recent years, Hajek[2] of Vienna has investigated the subject from its anatomical standpoint, by carrying out a number of submucous injections and observing the distribution of the fluid which was thus introduced. The interest aroused by a study of Case 1, described and figured in the earlier part of this paper, has led me to carry out a series of injection experiments, the results of which I find bear out, in the main, the conclusions already arrived at by Hajek. I shall now endeavour briefly to describe the arrangement of this tissue demonstrated in this way. The accompanying plates illustrate the more important of the experiments.

The following method was adopted:—The material used for purposes of injection consisted of carmine gelatin, well heated to render it perfectly fluid. Abortive attempts were previously made by injecting water or a mixture of water and glycerin, but, owing to the ready way in which these substances flowed out from the puncture, after removal of the syringe, the results proved unsatisfactory, and therefore the carmine gelatin was substituted. Although this substance in the fluid state is of a thicker consistence than water, it was found to permeate the tissues very readily, and it had the great advantage of quickly setting when cooled. A syringe with a fine pointed needle was used, care being taken to have it thoroughly warmed before use. The injections were made on fresh larynges, and the gelatin was found to pass through the tissues more readily if the larynx was first heated in hot water. The preparations were then fixed in Jores' fluid for twenty-four hours, then immersed in methylated spirits for five or six hours, and finally placed in a mixture of glycerin and water. There was no tendency for the gelatin to shrink when fixed in Jores' formalin solution, a result which certainly takes place when the injected larynx is first hardened in spirit.

The epiglottis.—It is convenient to commence with the study of the arrangement of the loose areolar tissue upon the anterior surface of the epiglottis. If we examine the anterior or lingual surface of this structure in the normal state, we find that, as the mucous membrane is reflected from it on to the dorsum of the tongue, it presents three distinct folds, which from their position and connections are designated the *median* and *lateral glosso-epiglottic folds.* On each side of the median fold there is a small depression, the *glosso-epiglottic fossa* or vallecula, situated between the median and external glosso-epiglottic fold on each side

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[1] "Traité de l'angine laryngée œdémateuse."

[2] *Arch. f. klin. Chir.*, Berlin, Bd. xlii. Heft 1.

(Plate VI. Fig. 2). Passing outwards transversely from each lateral margin of the epiglottis is another fold of mucous membrane, usually described as the *pharyngo-epiglottic fold* (Plate VI. Fig. 2). This structure, as will be presently shown, is of special interest in connection with the subject now under discussion.

The mucous membrane covering the anterior surface of the epiglottis and the glosso-epiglottic fossæ is very loosely attached to the underlying tissues. This is due to the presence of a considerable quantity of loose areolar tissue, a fact made readily evident by the ease with which the mucosa can be lifted up by a pair of forceps. A much better demonstration of this anatomical fact can be obtained by means of the injection of fluid, while the boundaries of the area can be more satisfactorily determined by the same method. If a syringe be filled with the warm fluid gelatin, and the needle carefully inserted beneath the mucous membrane at the anterior margin of one glosso-epiglottic fossa—at the point marked by the cross in Plate VII. Fig. 3—the following may be observed. The injection fluid travels without opposition from the base of the tongue into the fossa; as one proceeds to inject more of the material, it passes upwards on to the anterior surface of the epiglottis, readily lifting the mucous membrane before it. In the mesial plane, the median glosso-epiglottic fold forms a slight check to the further passage of the fluid. Beneath this fold the submucous connective-tissue layer is of rather a denser nature, consequently it offers a certain degree of resistance, and under the moderate pressure of the injection it can be made to bulge into the fossa of the opposite side. At the external margin of the fossa little or no resistance is offered at the site of the lateral glosso-epiglottic fold, and the injection passes readily in the direction of the pharyngo-epiglottic fold. If the experiment be repeated on the opposite side of the mesial plane, a similar result is got, and if only moderate pressure be employed, an appearance such as that presented in Plate VII. Fig. 4, is obtained, *i.e.*, two more or less spherical swellings occupy the position of the valleculæ, separated from each other by a groove, which indicates the position of the median fold; while with this amount of injection the upper portion of the anterior surface and the free margin of the epiglottis remain visible above the swelling.

If, however, a larger quantity of fluid be injected and considerably more pressure be employed, the extent of the area of loose areolar tissue becomes more accurately defined, while the appearances above noted undergo considerable change. Thus the temporary opposition offered by the slightly denser layer of tissue in the region of the median glosso-epiglottic fold gives way, the two areas of injection in front of the epiglottis become fused, and there is a very considerable increase in the size of the swelling. Anteriorly it is found to reach to a limited extent on to the dorsum of the tongue for a distance of 3 to 4 mm. beyond the margin of

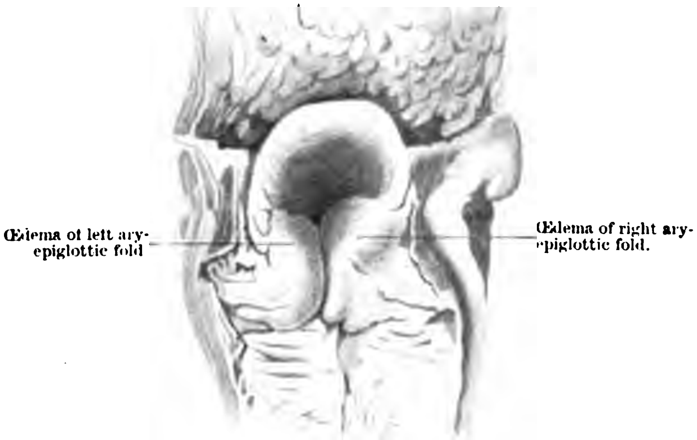
Œdema of left ary-epiglottic fold
Œdema of right ary-epiglottic fold.

Fig. 1.—Larynx from case of sudden death, due to œdema of ary-epiglottic folds.

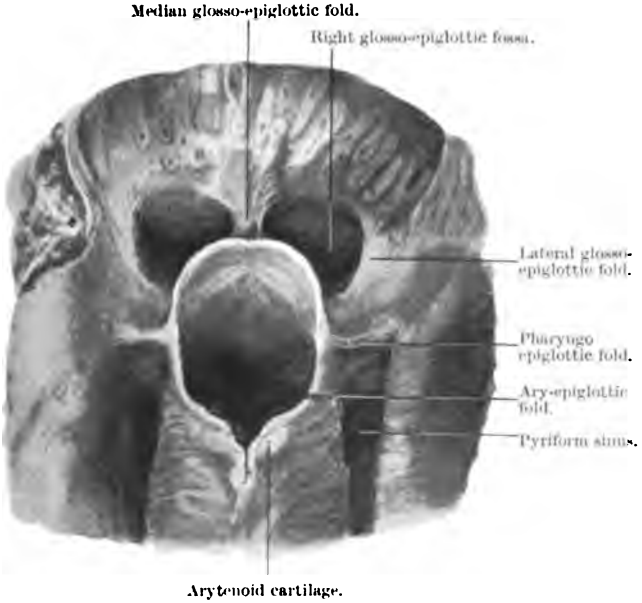
Median glosso-epiglottic fold.
Right glosso-epiglottic fossa.
Lateral glosso-epiglottic fold.
Pharyngo epiglottic fold.
Ary-epiglottic fold.
Pyriform sinus.
Arytenoid cartilage.

Fig. 2.—Base of tongue and upper aperture of normal larynx viewed from behind.

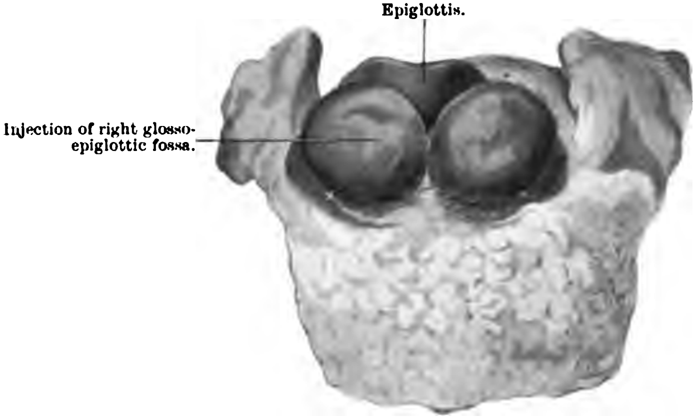

Fig. 3.—Showing moderate injection of both glosso-epiglottic fossæ.

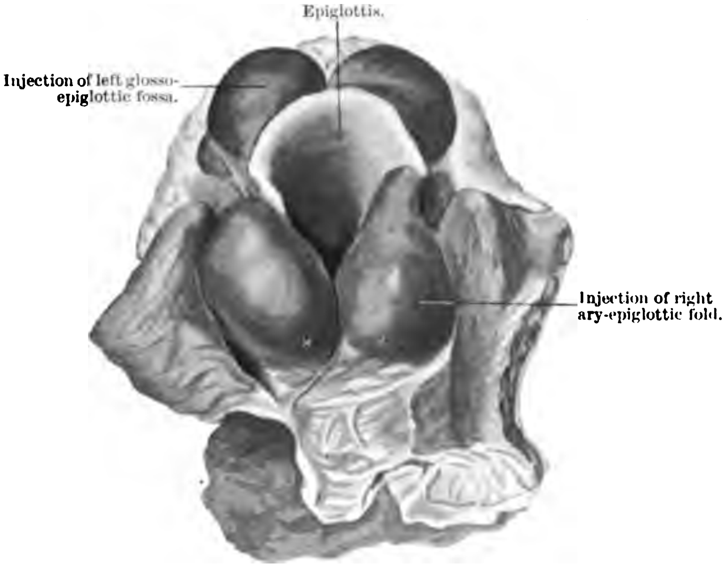
Epiglottis.
Injection of left glosso-epiglottic fossa.
Injection of right ary-epiglottic fold.

Fig. 4.—View of base of tongue and upper aperture of larynx showing moderate injection of glosso-epiglottic fossæ and ary-epiglottic folds.

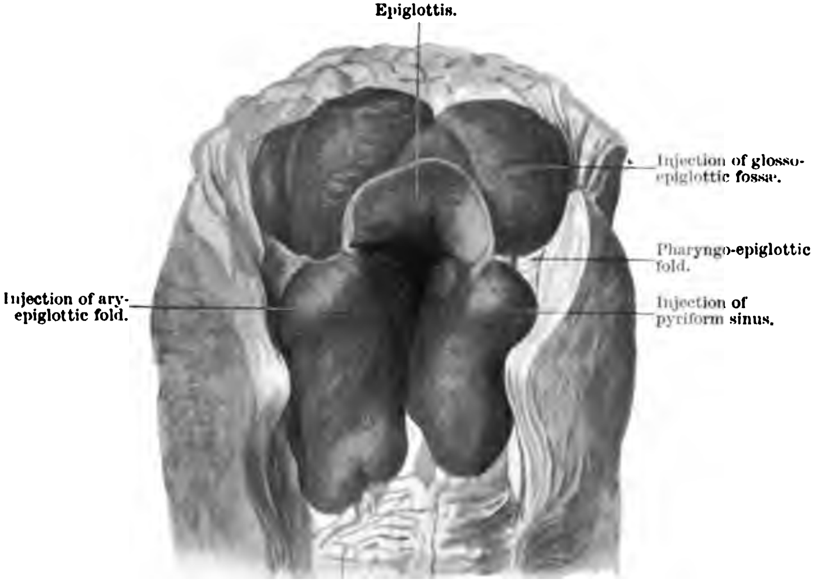
Epiglottis.
Injection of glosso-epiglottic fossæ.
Pharyngo-epiglottic fold.
Injection of ary-epiglottic fold.
Injection of pyriform sinus.

Fig. 5.—View of base of tongue and upper aperture of larynx showing forced injection of glosso-epiglottic fossæ and ary-epiglottic folds.

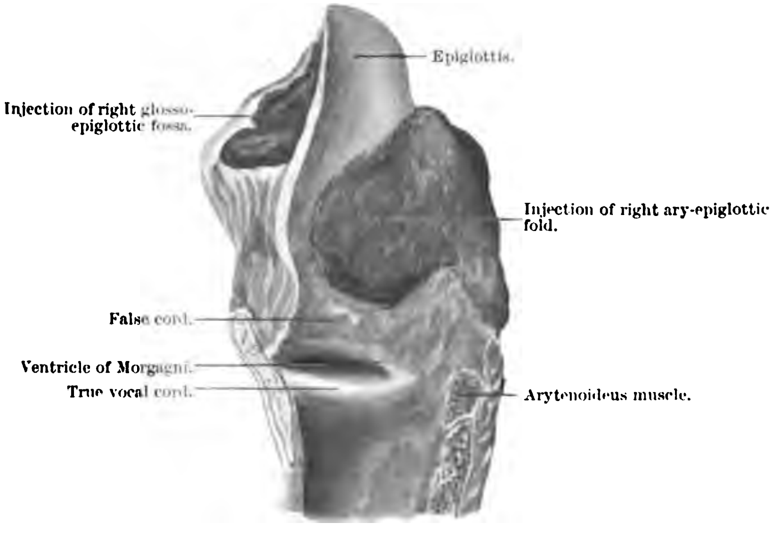
Epiglottis.
Injection of right glosso-epiglottic fossa.
Injection of right ary-epiglottic fold.
False cord.
Ventricle of Morgagni.
True vocal cord.
Arytenoideus muscle.

Fig. 6.—Antero-posterior vertical section showing interior of right half of larynx.

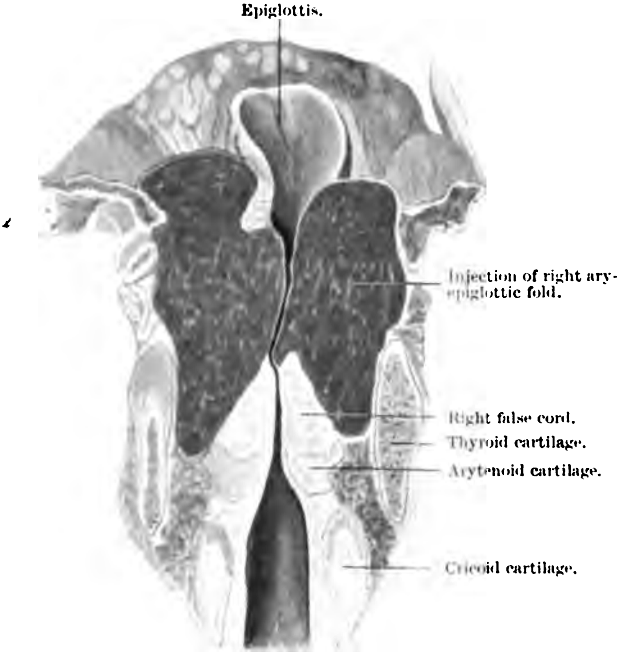

FIG. 7.—Coronal vertical section of larynx viewed from behind showing occlusion of lumen from injection of ary-epiglottic folds.

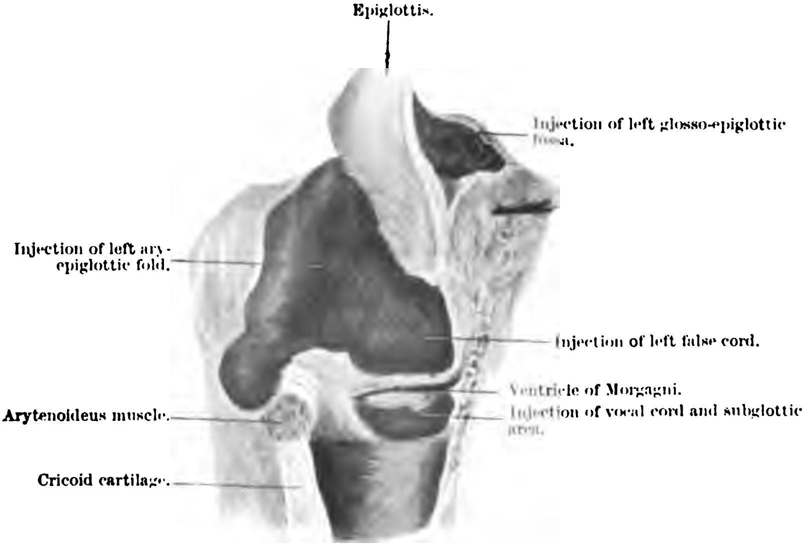
Epiglottis.
Injection of left glosso-epiglottic fossa.
Injection of left ary-epiglottic fold.
Injection of left false cord.
Ventricle of Morgagni.
Arytenoideus muscle.
Injection of vocal cord and subglottic area.
Cricoid cartilage.

FIG. 8.—Antero-posterior vertical section showing interior of left half of larynx.

the valleculæ. Externally the fluid passes towards the lateral wall of the pharynx. In the more important region of the epiglottis itself, the fluid, under increased pressure, spreads over the anterior surface of that structure until it reaches its free margin, where it produces a rounded swelling which conceals from view the normal contour of the epiglottis. Beyond the free margin, however, it will not pass, as along that line the mucous membrane becomes very closely applied to the underlying cartilage, and the loose cellular stratum disappears. It is therefore impossible to force the submucous injection over the epiglottis on to its laryngeal surface, while the cartilage of the epiglottis itself forms an impervious barrier to the further passage of the fluid. If we next examine the area lying between the margin of the epiglottis and the lateral pharyngeal wall, that is to say, the position occupied by the pharyngo-epiglottic fold of mucous membrane on each side, we find that a temporary check is given to the passage of the fluid in that situation. Beneath this fold, as was found to be the case at the median glosso-epiglottic fold, there is a somewhat denser layer of connective tissue, which extends between the deep surface of the mucous membrane and the free edge of the hyo-epiglottic ligament beneath. This, however, will, under somewhat more forcible pressure, give way, and the fluid can then find its way into the loose areolar layer beneath the mucous membrane of the pyriform sinuses and aryteno-epiglottidean folds. We find, therefore, that the swelling which results from forced injection of a considerable quantity of fluid into the loose submucous tissue between the base of the tongue and the epiglottis may be of very considerable extent, and form a rounded mass completely concealing from view the whole of the anterior surface of that structure. It is interesting to observe that, when an experimental injection of this nature is made, the epiglottis is neither pushed backwards towards the upper laryngeal aperture, nor is there any tendency to a backward incurvation of its lateral margins. On the contrary, the epiglottis tends to become broadened out, its lateral margins diverging from each other to a greater extent than is found in the normal larynx. Plate VIII. Fig. 5, shows the large injection mass in front of the epiglottis as viewed from behind; it is limited by the free margin of that structure; the position of the pharyngo-epiglottic fold is also clearly defined on each side. In this case no attempt was made to break down the opposition offered by the somewhat denser tissue beneath these folds. This, however, could have been accomplished with a little additional pressure.

The aryteno-epiglottidean folds.—These two folds which form the lateral margins of the upper aperture of the larynx (Plate VI. Fig. 1) have long been recognised as specially liable to the development of œdema. This is due to the fact that a considerable quantity of loose areolar tissue is present between the two layers of mucous membrane which constitute each fold. The injection experiments demonstrate very successfully the arrangement of the mucous layers and the subjacent tissue. When the needle is inserted at the posterior-inferior extremity of the fold immediately in front of the cartilage of Wrisberg, and the fluid is directed upwards towards the margin of the epiglottis, the following changes are observed:—The two layers of mucous membrane which together form the fold are very readily separated from each other as the fluid is driven forwards. The inner layer, which is continuous with the mucous membrane covering the interior of the larynx, is raised from the lower and lateral part of the laryngeal surface of the epiglottis, and a swelling is formed in that situation. The outer layer, continued as the lining membrane of the pyriform sinus, is similarly affected, and the sinus readily becomes infiltrated with the injection material. The fluid also passes, without opposition, forwards and upwards to the lateral margin of the epiglottis, while part of it finds its way downwards over the posterior surface of the arytenoid cartilage, so loosely is the mucous membrane attached in this situation. If only moderate pressure be employed, the appearances represented in Fig. 4, Plate VII., are obtained. On the right side the swelling has assumed the pear-shaped form which is so frequently seen clinically in cases of chronic œdema of the ary-epiglottic fold. With a moderate injection of this kind the lumen of the larynx remains comparatively free, and normal respiration could doubtless be carried on without any discomfort.

If, however, a considerably greater quantity of fluid be injected into the ary-epiglottic folds, the swelling can be made to assume such large proportions as to completely block the upper aperture of the larynx and to occupy the whole of each pyriform sinus (Fig. 5, Plate VIII.). Fig. 6, Plate VIII., which represents the interior of the right half of a larynx, divided vertically in the mesial plane, shows the extent to which the injection will travel over the inner surface of the larynx. Anteriorly, but only to a somewhat limited extent, the mucous membrane covering the laryngeal surface of the epiglottis is stripped from the underlying cartilage by the invading fluid. Inferiorly, the upper margin of the false cord or ventricular band limits the further spread of the injection in that direction, although under greater pressure this can be broken down and the submucous tissue of the false cord can also become injected. Posteriorly and inferiorly, the mucous membrane covering the laryngeal aspect of the cartilage of Wrisberg and the arytenoid cartilage is firmly united to these underlying structures; consequently this surface remains free from the injection fluid introduced into the ary-epiglottic fold, as shown in Plate VIII. Fig. 6. Owing to this anatomical barrier, one fold cannot be injected from the other in this situation, and thus when both folds are injected a bilateral tumefaction is produced, the two swellings remaining distinct from each other. On the posterior or œsophageal aspect of the larynx, the fluid will readily pass from one side to the other, owing to the loose attachment of the mucous membrane in this situation. The fluid, however, cannot spread over the upper free margin of the inter-arytenoid fold and descend upon the posterior laryngeal wall. It is not out of place to mention here that the presence of a limited amount of loose areolar tissue beneath the mucous membrane of the posterior wall of the larynx permits of the injection of a small quantity of fluid in this situation.

If we again turn our attention to Fig. 5, Plate VIII., and examine the anterior and upper extremities of the ary-epiglottic folds injected under considerable pressure, we find that the fluid has reached the pharyngo-epiglottic folds. The somewhat denser layer of submucous tissue beneath them forms a temporary check to the passage of the fluid into the glosso-epiglottic fossæ.

The illustration further demonstrates the fact that the injection fluid has failed to pass from these fossæ backwards into the ary-epiglottic folds and pyriform sinuses. If further injection be made, in either of these two situations, the barrier breaks down and the fluid passes uninterruptedly from one area to the other.

When forcible injection of the two ary-epiglottic folds is made, their inner layers approximate so closely to each other in the mesial plane, that they conceal from view the false and true cords. The lumen of the larynx is also occluded to such an extent, that, were the same degree of swelling attained in the living subject, asphyxia would be produced unless relieved by surgical interference. In other words, there is here reproduced artificially the same condition as was found in Case 1 (Plate VI. Fig. 1) which proved so rapidly fatal. Fig. 7, Plate IX., is a coronal vertical section through the larynx, showing the injection-mass occupying each ary-epiglottic fold and filling up the two pyriform sinuses. The two inner layers of these folds are so closely approximated to each other, that the larynx is almost completely obstructed.

It was clearly shown in several of the experiments, that the greater part of the laryngeal surface of the epiglottis could not be injected from the ary-epiglottic folds. In Case 1 this surface remained free from œdema. If the needle of the syringe be inserted beneath the mucous membrane in this situation, it will be found impossible to make the fluid pass underneath it, so firmly is it bound down to the subjacent cartilage. In the earlier experiments upon the glosso-epiglottic fossæ, attention was drawn to the fact that the fluid could not be forced over the free margin of the epiglottis on to its posterior aspect. Consequently we find that the laryngeal surface cannot be injected, a fact which the majority of the illustrations clearly show.

It will also be observed that injection of the ary-epiglottic folds produces a marked backward incurvation of the lateral margins of the epiglottis (Fig. 7, Plate IX.); this simulates the infantile type of larynx.[1] As the introduction of fluid between the two layers of the ary-epiglottic folds tends to bring about this infantile form, it follows that in the larynx of the young child and in those cases occasionally met with where the infantile type persists in adult life, a lesser amount of œdema will tend to cause respiratory difficulty. It is probable, too, that the dyspnœa which may supervene in a case of laryngeal diphtheria in a child may be due to a slight amount of œdema of the ary-epiglottic folds before any false membrane has formed in the larynx.

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[1] *Brit. Med. Journ.*, London, Dec. 1, 1900.

While post-mortem experiments of this nature cannot be regarded as furnishing exact representations of what may occur in the living body, they nevertheless accurately demonstrate both the amount and the extent of the loose cellular tissue present beneath the mucous membrane. In other words, they show to what extent the tissues in any situation are capable of being invaded by a serous or sero-purulent exudation. Fig. 3, Plate VII., does not portray a fanciful picture; œdema limited to the anterior aspect of the epiglottis is met with clinically, and in Case 2, described in the earlier part of the paper, we have a clinical prototype of the appearances thus artificially produced. That it is possible for the submucous exudation to remain limited to one glosso-epiglottic fossa, is shown by the study of two cases of an acute phlegmonous inflammation described by Caz.[1] In both of his cases there was hyperæmia and swelling of the right vallecula, the epiglottis being pushed somewhat to the left side, while the left glosso-epiglottic fossa remained empty, and thus formed a distinct contrast to the fossa on the opposite side. The question of the spread of the œdema from the region in front of the epiglottis backwards and downwards to the aryteno-epiglottidean folds and pyriform sinuses, is one of considerably greater clinical importance, because of the risk of obstruction to the larynx that may at once arise when these folds become œdematous. So long as the swelling is confined to the anterior aspect of the epiglottis, the only clinical symptoms that may be met with are sore throat, pain on swallowing, and perhaps the sensation of the presence of a foreign body. When, however, the œdema involves the ary-epiglottic folds, the additional grave symptom of dyspnœa supervenes. These points are also illustrated in the three cases which form the text of this paper. In Case 2 the inflammation and œdema were confined to the region in front of the epiglottis, and the patient only suffered from sore throat and painful deglutition. In Case 1, again, the œdema was limited to the upper laryngeal aperture, and dyspnœa alone was complained of. In Case 3, on the other hand, both these situations were involved in the inflammatory process, and a combination of symptoms was accordingly met with. The sequence of events in this last case clearly suggested that the inflammation had commenced in the area in front of the epiglottis, and thence had spread downwards to the ary-epiglottic folds.

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[1] *Arch. f. Laryngol.*, Berlin, 1898, Bd. viii. Heft 2.

A study of these cases, and the knowledge derived from the injection experiments, leads us to a consideration of the two following points. To what extent does the layer of denser tissue beneath the pharyngo-epiglottic fold of mucous membrane play a part in preventing the spread of œdema in the living body? Secondly, was the further spread of the œdema downwards into the larynx in Case 2 prevented by this barrier, or only by early treatment, and would the same result have been achieved in Case 3 had the same early treatment been possible? These two questions cannot be separately discussed. Recognising, as we must, from injection experiments repeatedly performed, that a difference exists between the density of the submucous areolar tissue in the glosso-epiglottic fossæ and ary-epiglottic folds on the one hand, and that lying beneath the pharyngo-epiglottic folds on the other, there is some justification for assuming that a serous exudation may be at any rate temporarily checked by it. If that be so, the delay thus given may admit of timely treatment preventing the further spread of the œdema towards the larynx. That this structure cannot act in the same definite way in the living body as it does in the dead, must be evident, because in the former the inflammation can naturally spread by continuity of mucous membrane. Œdema may consequently be thus produced in the area beyond the barrier. At the same time, I think we are justified in assuming that even in the living tissues a temporary check may thus be offered to the onward spread of the œdema, and so may retard the onset of the graver symptom of dyspnœa and permit of treatment proving more effectual. It is very improbable that œdema will find its way upwards and forwards from the ary-epiglottic folds to the glosso-epiglottic region, at any rate before tracheotomy is rendered necessary. In Case 1 these folds had become infiltrated to such an extent as to completely occlude the upper laryngeal aperture before any œdema had reached the anterior aspect of the epiglottis.

The false cord or ventricular band.—Under the mucous membrane of the false cord, the areolar tissue is somewhat sparsely developed. If the syringe be inserted close to the anterior end of the cord, at the spot indicated by the cross ×, in Fig. 8, Plate IX., the fluid finds its way fairly readily beneath the mucosa, though the injection is made with less facility than in the ary-epiglottic region. Under moderate pressure the fluid is confined to the area of the false cord, but if this be increased the intervening barrier is broken down, and the fluid passes beneath the inner layer of the ary-epiglottic fold, and may be gradually forced backwards and upwards, diffusing itself over a considerable area of this fold, if the injection be continued. The swelling produced by injection of the false cord is somewhat limited in size, but if the experiment be carried out on both sides of the larynx, its lumen thus becomes very considerably narrowed. As the ventricular band forms the upper and inner boundary of the ventricle of Morgagni, both the entrance to the ventricle and the dimensions of the space are considerably restricted by the presence of the injection fluid in it. In Plate XI. Fig. 8, the injection has not passed quite so far as the inferior border of the false cord.

The true vocal cord and subglottic area.—Œdema of the true cord depends mainly upon a serous infiltration of the areolar tissue which assists in forming that structure. This has been shown by Hajek in his experiments. If the needle of the syringe be introduced beneath the mucous membrane covering the upper surface of the cord, at a point immediately in front of the vocal process, the injection passes forwards without opposition. It finds its way also outwards into the inferior and outer wall of the ventricle, and in doing so tends to considerably occlude the entrance to that space. If only moderate pressure be employed, the fluid is confined to this aspect of the cord, and does not pass below its free margin. If, however, further injection be made in the same situation, the under surface of the cord and the subglottic area also become injected, a rounded swelling being formed, such as is represented in Fig. 8, Plate IX. If the injection be made beneath the inner free margin of the cord, similar changes are observed, that is to say, the fluid is at first confined to the subchordal area, but under increased pressure will extend to the upper surface of the vocal cord. If a transverse section be made of a cord thus injected, it will be seen that the fluid has infiltrated the whole thickness of that structure. It will further be observed in Fig. 8, Plate IX., that the subglottic œdema is confined to a somewhat small area, the lower limit of which is not defined by a horizontal line, but presents a convex margin with the most dependent part of the curve in the centre.

If both vocal cords become œdematous, the glottic chink is readily closed by the bilateral swellings coming into contact, and great difficulty in breathing is produced. It is to this condition alone that the term "œdema glottidis" is really applicable. Though this term is frequently used, it is in the majority of cases incorrectly applied. Œdema of the true vocal cords is comparatively uncommon, the aryteno-epiglottidean folds on the other hand being the most usual site of this condition, and the application of the term œdema glottidis to a serous exudation in the latter situation is anatomically incorrect. Risch[1] reports the case of a man who died from asphyxia, and in whom he found, on post-mortem examination, that both true vocal cords were œdematous, and were flattened against one another, completely closing the glottic chink. Morell Mackenzie only twice met with œdema of the true cords, and looked upon the condition as a rare one.

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[1] *Berl. klin. Wchnschr.*, 1866, No. 33.

Subglottic œdema may be entirely confined to the area below the cords, and it certainly occurs more frequently than the previous variety. It has been described by Sestier, Cruveilhier, and others. Gibb has reported a case of dyspnœa in which the œdema was confined to the subglottic region on each side of the larynx. He emphasises the importance of performing tracheotomy instead of laryngotomy in cases demanding surgical interference, as by the former operation one gets more effectually beneath the site of the obstruction. Extension of the œdema to the submucous tissue of the trachea is apparently not common. Amongst 132 cases of œdema of the upper air passages, Sestier found œdema of the trachea only seven times. One can only with some difficulty raise the mucous membrane of the trachea in the blades of the forceps, and it is by no means easy to force the injection fluid beneath it.

In conclusion, we should point out that œdema originating in the region of the tonsils will pass downwards to the glosso-epiglottic fossæ, and thence will find its way to the ary-epiglottic folds. Similarly, œdema of the lateral wall of the pharynx will spread to the pyriform sinus, and from there reach the ary-epiglottic fold. In this way dyspnœa may supervene as a grave complication of faucial and pharyngeal inflammation. It is interesting to observe, in connection with the injection experiments made in these two situations, that beneath the mucous membrane of the posterior pillar of the fauces there exists a barrier of dense tissue, which interferes with the fluid spreading from the tonsillar region to the lateral pharyngeal wall lying posterior to it.

ON THE SYMPTOMS AND DIAGNOSIS OF CARCINOMA OF THE HEPATIC FLEXURE OF THE COLON.

By A. Ernest Maylard, B.S., *Surgeon to the Victoria Infirmary, Glasgow.*

Increasing experience in the diseases which affect certain anatomical regions of the body, tends to teach that many more differences exist in the symptoms which may arise than was at one time supposed. These differences doubtlessly owe their origin to the particular locality of the region involved; and so diverse are they, in certain instances, that it is a mistake to attempt to include them in any combination, however much general anatomical considerations might indicate or suggest that they should be so dealt with. Thus, while it is frequently the custom to speak of carcinoma of the colon as a disease *per se*, there is little doubt that much difficulty and confusion would be removed, and greater accuracy in diagnosis attained, if the colon were looked upon, not so much as an anatomical and physiological entity, but as a more or less complex part of the organism, whereby disease at one part presents a train of symptoms peculiar to itself, and therefore different from that of another part.

It would simplify these few remarks, and tend to a better understanding of them, if a brief and cursory reference were made to the anatomy of the colon and its functions.

Commencing in the right iliac fossa, the course taken by the large bowel is directly upwards to beneath the right lobe of the liver, where, in making its sharp bend—the hepatic flexure—it lies on, or to, the outer side of the second or descending portion of the duodenum. From this point its course is a comparatively free one, although there is much variation in the directness with which it crosses the abdomen to reach the lower margin of the spleen. The sharp bend—the splenic flexure—made below the spleen is more deeply situated than the corresponding flexure beneath the liver, so that the descending colon rises somewhat in its course downwards to the left iliac fossa. Here it passes without any distinctive differentiation into the omega or sigmoid segment, which again is imperceptibly continuous with the rectum.

Regarding the functions of the colon, it is probably primarily and essentially a receptacle for the chyme. That by the storage here of the more or less effete products of digestion an intermittent evacuation is permitted. But that other important functions are subserved is equally certain, and associated with the enforced retention of the chyme. The changes which this undergoes is well seen in the difference between the intestinal contents as they enter through the ileo-cæcal valve, and as they leave the rectum. One change is very obvious, and that the solidification which takes place, owing to the absorption of the more fluid constituents. But other changes equally clear, though more difficult of explanation, are the chemical conversions, brought about partly by the intestinal juices secreted in the colon, and partly by the other digestive juices which come from higher up, and probably continue their action within the large bowel. The result of these processes is the gradual conversion of the chyme into fæces.

The bearing of these normal anatomical and physiological conditions may now be considered in relation to disease, as it affects more particularly the region of the hepatic flexure.

Nothing need be said of the nature of the pathological lesion in so far as it concerns the histological type of the growth. Carcinoma of the colon, wherever occurring, partakes of the character of the epithelium from which it arises; which, with the fewest possible exceptions, is of the columnar-celled variety.

When carcinoma attacks the hepatic flexure, it involves a part of the colon which is more or less fixed, in close relation to the duodenum, and sufficiently near to the entrance of the small intestine at the ileo-cæcal valve for the intestinal contents to be in a fluid state. The result of these natural conditions is, that, as growth progresses, it invades the neighbouring parts, and is as likely to obstruct the duodenum as the colon. This obstruction to the duodenum may be directly through invasion, or indirectly from external pressure or displacement through adhesions.

The gastric symptoms and other digestive disorders which are frequently such marked and misleading features in carcinoma of the hepatic flexure, probably find their explanation in the derangements brought about, first by the special locality of the disease in the colon; and, second, through the involvement of the duodenum. It may happen that prior to these specific symptoms, more or less generalised manifestations of malignant disease have become evident. For one peculiarity of growth here is, that it may advance to a considerable stage before obstructive symptoms arise; and, further, it must be remembered that minor obstructive influences may exercise insidious effects upon the patient's health some time prior to the manifestation of more obvious obstructive symptoms.

Dealing first with the locality of the disease in the colon, as it affects digestion, it is probable that these derangements are more marked in disease of the hepatic flexure and ascending colon than in the more distally situated segments. Obstruction, say in the sigmoid flexure, leaves the greater portion of the large intestine free to contain and deal with the chyme poured into it; the damming back effects are less felt by the small bowel, because the large gut is able for a considerable period to accommodate itself to the altered conditions, by enlargement and by effecting those necessary physiological and chemical changes embraced in the conversion of the chyme into fæces. But when the obstruction is seated higher up the bowel, as at the hepatic flexure and parts proximal to it, no such compensatory and natural processes can take place, or, rather, they are very materially lessened; the result being that the digestive processes are much more gravely disorganised. The patient then complains of bilious attacks, and erroneously attributes his symptoms to some derangement of the stomach, or to the faulty selection of suitable food.

But in dealing with the second cause of the digestive symptoms, there is in the involvement of the duodenum a more cogent factor in the production of these derangements. The purely gastric symptoms may become so striking as to entirely mask all possible indication of disease elsewhere. As already indicated, this implication of the duodenum may be effected in two or more ways, but all tending in the direction of obstruction. Pressure on the duodenum, when due in some way to the growth, is likely to be constant in its effect; but when it arises from a distended colon, its obstructive influences may be intermittent. To this want of constancy may be due the great variableness of the gastric symptoms. The secondary influences, however, upon the stomach are those the result of obstruction. Dilatation is followed by the prolonged retention of the gastric contents. The patient gets no relief until the stomach is emptied, vomiting is evoked, or the contents are artificially removed, when it is frequently found that food taken some twenty-four hours previously is present in the vomit. Indeed, a train of symptoms become manifest, almost indistinguishable from those associated with obstruction at the pylorus. It need hardly be wondered, therefore, if mistakes are made in rightly interpreting the cause of symptoms which point to, and indeed obviously are connected with, gastric trouble.

It has fallen to my lot, comparatively recently, to see two cases where the symptoms, as they showed themselves at the time, so markedly suggested gastric disease, that an exploratory operation was performed with the expectation of finding the stomach at fault. But although in both instances the viscus was markedly dilated, nothing otherwise was discovered amiss; and it was not until the examination was carried further afield, that extensive disease of the hepatic flexure of the colon was discovered.

The first case was that of a gentleman whom I saw in consultation with Dr. J. Wyllie Nicoll of Glasgow, who has been kind enough to provide me with the following notes of the case:—

Case 1.—"The patient was first seen by me when he came to Glasgow in November 1899. His complaint was, attacks of pain in the epigastric region, followed by vomiting, which brought relief. These attacks had occurred at intervals during the past two years. More recently the amount returned would sometimes be sufficient to fill a chamber-pot. Before coming to Glasgow, he had been seen at different times by five other medical men, including one consulting physician. All concurred in the opinion that his illness was connected with his stomach. He had all his life been troubled with constipation. When seen by me, he was thin, but not emaciated. Percussion showed the lower border of the stomach at about the level of the umbilicus, and splashing was heard down to that level. As he had already been under treatment for some time, and without any permanent improvement, I suggested an exploratory incision. His wife, however, was averse to operation, and wanted a still further opinion. He saw another medical man, who also gave it as his opinion that the stomach was dilated. Operation was postponed, and I treated him by dietary and gastric lavage, with the result that considerable improvement took place, and he gained 11 lb. in weight. A recurrence of his symptoms, however, set in again, and he then submitted to an exploratory operation."

The only additional fact elicited in this case was, that a test breakfast, given on two separate occasions, showed the presence of free hydrochloric acid in the gastric contents.

At the operation the following was the condition of things revealed:—A tumour mass involving the hepatic flexure, invading the duodenum, and bound down by inseparable adhesions to the under surface of the liver, and to some enlarged lymphatic glands. Further, the cæcum and ascending colon were greatly distended with fæces.

The second case was, if anything, even more misleading.

CASE 2.—Here there was a history of pain in the epigastric region about half an hour after taking food. By a careful selection of diet the symptoms were lessened. He suffered from flatulence and a sense of gastric distension. *His bowels had always been regular.* Physical examination revealed no tumour, but showed the stomach to be dilated to *below* the level of the umbilicus. Succussion was present. Vomiting took place at intervals of from two to three days. A test breakfast, given on two separate occasions, showed complete absence of free hydrochloric acid, as tested with dimethyl-amido-azo-benzol. In operating upon this case my first impression was, after opening the abdomen, that we were dealing with a tumour mass involving the pylorus, but, as separation of the adhesions was proceeded with, it soon became clear that the growth had no connection with the stomach, but was part of the hepatic flexure of the colon. The bowel with its diseased area was completely freed and brought out of the abdomen, and subsequently amputated.

Further remarks, however, on the case are not needed, as they do not bear specially upon the subject, except that all stomach symptoms disappeared.

The question then naturally arises, How are we to differentiate between cases of primary disease of the pylorus—for it may be said to be with this particular form of gastric disease that confusion is most likely to arise—and those in which the duodenum is being obstructed secondary to carcinoma of the hepatic flexure of the colon. It can only be, I believe, on the score of probabilities, based on a careful investigation of the earliest symptoms. Before, as a rule, the duodenum will be obstructed, considerable growth will have taken place in the colon, and with this a train of symptoms arises, suggestive of some grave mischief, while the comparatively slight digestive disturbances do not appear to receive sufficient explanation from anything connected with the stomach. In other words, the patient will be suffering from emaciation, increasing weakness, want of appetite, and possibly bowel trouble, some time prior to the manifestation of any marked gastric symptoms. Indeed, in the first case alluded to, a more searching history of the case which my discovered error led me to make, revealed the fact that there were definite bowel symptoms before his attention and that of his doctors had become almost exclusively taken up with his supposed gastric disease.

But while these will be the proper lines upon which to proceed, in our attempt at differentiation, there certainly, I believe, will always be cases which will get the better of us, at least until we have discovered some other more distinctive signs or symptoms, enabling us exactly to localise the seats of primary disease. I think the second of the above two cases sufficiently supports the truth of these conclusions. The patient always had regular actions of the bowels, his pain was in the epigastric region, and came on after food, his stomach was dilated, he vomited, and there was no free hydrochloric acid in the vomit. Such a train of symptoms, from beginning to end, could hardly fail to direct attention away from large intestine disease to a gastric complication. And it is not difficult, in the light of this case, to understand why it should be so, for the disease by its adhesions and position told, as a matter of fact, sooner on the first part of the duodenum than it did on the part from which it took its origin. The earliest symptoms evoked were those connected with the obstruction of the duodenum, and these naturally would be gastric.

If, then, I attempt to summarise these few remarks, it would be, in the first place, to say that by no means known to us at present can we arrive at anything more than a suggestive diagnosis of carcinoma of the hepatic flexure of the colon; but the symptoms which we may take as fairly suggestive of disease in this particular region are the following:—

1. The prominence of digestive derangements, in association with other symptoms indicative of colon disease.
2. The order in which these symptoms arise, first in connection with the bowel, and secondarily in connection with the stomach.
3. The symptoms associated with attacks of hepatic flexure obstruction are acuter than those connected with obstruction more distally situated, and do not usually occur until the patient has already shown signs of constitutional disease.
4. Pain is a commoner and more acutely felt symptom in disease of the cæcum, ascending colon, and hepatic flexure, than when the growth attacks other segments of the large bowel. Further, the pain is usually felt over the seat of the disease.
5. While the symptoms may suggest disease of the colon, up to and including the hepatic flexure, the absence of any tangible growth in the right iliac and lumbar regions will point to implication of the flexure.

THE USE AND ABUSE OF ETHER AS A GENERAL ANÆSTHETIC.

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In considering the use and limitations of ether as a general anæsthetic in the present day, it will be well to remember that in the year 1846 this was the only drug available; and, though imperfectly administered, its properties were gradually becoming appreciated. The effects of nitrous oxide had been demonstrated by Morton in 1844; but its failure to procure a satisfactory state of unconsciousness for surgical operations had caused it to be placed temporarily on one side, and it was not till 1847, the year after the introduction of ether, that Simpson published his "Notice of a New Anæsthetic Agent as a Substitute for Sulphuric Ether in Surgery and Midwifery."

The valuable qualities of chloroform were quickly recognised, and ether was gradually pushed out of the front rank; and in some places, and perhaps in none more than the city which first saw the introduction of the more powerful drug, it has never regained an honourable position.

But the reason for the partial failure of ether, as also of nitrous oxide, lay not so much in the drug itself, as in the methods employed for its administration. These were of two varieties, the simple, and the complex. The simple consisted of placing a sponge in the folds of a towel, pouring the ether on to it, and then applying it to the face of the patient, much in the same way as chloroform is sometimes given. In the complex way the ether was given from some form of apparatus, occasionally very elaborate, and the vapour was usually conveyed to the patient by means of a tube.

The simplest way of giving ether, generally known as the "open" method, causes such waste of the liquid and annoyance to the bystanders, as well as being more frequently followed by bronchitis and other forms of lung trouble, that it has practically been abandoned in this country, except in those cases in which a free supply of air must be given with the ether, such as to patients with advanced heart disease. In these cases a semi-open inhaler, such as Rendle's inhaler for the A.C.E. mixture, is generally used. The "open" method is still employed to some extent in America, with an inhaler known as Allis'.

It was not till Clover demonstrated the great advantage of curtailing the supply of air to the patient during the induction period, that the administration of ether was first placed in its proper position. This "closed" method, as opposed to the "open" method mentioned above, consists essentially in the use of an indiarubber bag, into which the patient breathes, and by this means the 30 per cent. of ether vapour, which Snow calculated to be necessary to produce anæsthesia, can be presented to the patient without the chilling effect caused by the evaporation of the large quantities of the liquid which must be used when the "open" method is employed. Unconsciousness is obtained sooner, and with less excitement; and as the apparatus is kept warm by the patient's breath, there is less risk of the administration being followed by bronchitis.

Though some administrators prefer the more simple inhaler of Ormsby, Clover's two forms of the "closed" inhaler, with various small alterations, are still in use; and since the introduction, in 1876, of nitrous oxide as a preliminary measure, which was also due to Clover, no important change has been made in the administration of ether.

As the earlier methods of giving ether were accompanied by so much excitement and coughing, chloroform, which is more pleasant than ether when given in the "open" method, and which does not require much apparatus for its administration, soon became established as the routine anæsthetic; and even in London the title of chloroformist is still at some hospitals applied to the recognised anæsthetist on the staff, although he may be in the habit of using the safer drug much more frequently than chloroform. As the effect of Clover's work gradually became diffused, the valuable properties of ether became more appreciated, so that in many places it again, in its turn, supplanted chloroform, while the term "etherist" was applied to those who most energetically supported its claims.

Nowadays the recognition of the special branch of anæsthetics, and the work of many distinguished administrators, have caused the pendulum, which at one time seemed inclined to stop at one extreme or the other, to come to a position of rest somewhere midway between the two; and, in the minds of those who give special attention to the subject, the question to be decided is no longer, "Is ether a better anæsthetic than chloroform?" but—"In this particular case, which drug, or which combination of drugs, will probably be the best for the welfare of the patient, and the necessities of the operation?"

The safety of the patient is of course the first point to be considered; and statistics from all sources leave us in no doubt on this head. Against the still large number of fatalities during the early stages of chloroform inhalation, death during and due to the inhalation of ether is remarkably rare.

In the upright position alone the number of deaths due to chloroform is appalling, from those quoted by Snow in his work on the subject, down to the latest account of the dentist who places his patient in a chair, pours some chloroform on to a towel, holds it to the patient's face, and in a few minutes is startled to find him dead. That this disaster is due to the cerebral anæmia produced by the accumulation of blood in the "abdominal pool," has been proved and demonstrated again and again by Leonard Hill;[1] and if ether had no other use, it would still be worth retaining for those cases in which the surgeon wishes to operate in the mouth or post-nasal space, with the patient sitting upright in a chair, and when the anæsthesia procured by nitrous oxide would be insufficient.

Not one of the most ardent advocates of the benefits of chloroform can deny that death has often occurred when it has been administered to an apparently healthy young adult for the performance of some trifling operation, such as the removal of a toe-nail; while, with ether, such an occurrence is practically unknown.

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[1] *Brit. Med. Journ.*, London, 1897, vol. i. p. 959.

This greater safety during the early stages of the administration, when the patient is stimulated instead of being depressed, as with chloroform, is a powerful argument for the use of ether; and even when it is advisable to change the anæsthetic during the course of an operation, the absence of fatalities during the induction of anæsthesia will cause ether to retain its place. Chloroform has certainly a more pleasant smell than ether, but when the administration is begun with nitrous oxide, and is conducted with a reasonable amount of skill, the patient should not be conscious of the smell or taste of the ether; and to the great majority of people this method is at least not more unpleasant than the inhalation of chloroform, while consciousness is sooner lost. Of course the argument of portability, etc., is a strong one in the case of military surgery, and perhaps that of the country practitioner; but this does not apply to the administration of anæsthetics in a hospital or infirmary, where all the necessary apparatus can usually be obtained with ease.

Besides the great advantage of the stimulating effect of ether at the beginning of the administration, this valuable quality may be demonstrated towards the end of any prolonged operation. When the pulse is gradually becoming smaller and faster, the change in the anæsthetic from pure chloroform to a mixture with ether, or to ether alone, is shown by the fuller and more satisfactory state of the pulse which soon follows. In these cases it is better as a rule not to give the ether from a closed inhaler, but one such as Rendle's mask for the A.C.E. mixture.

This stimulating effect also makes ether most useful in operations which in themselves may be expected to produce a certain amount of shock, such as resections of large joints, major amputations, etc.; and it is also chosen by many administrators for operation about the rectum or anus.

Passing from the consideration of the use of ether, we will now turn to the abuse of the drug; and it cannot be denied that the over-zealous "etherist" has given to the "chloroformist" some occasion to state that if chloroform kills a patient on the operating-table, ether will kill him in his bed; in other words, that though death from cardiac syncope is practically unknown during the inhalation of ether, death, caused to some extent by bronchitis or broncho-pneumonia, has undoubtedly followed the administration of ether.

The abuse of ether may be considered under the following four heads:—

1. It is given to unsuitable subjects; such as those to whom its stimulating effects might be prejudicial, as patients suffering from advanced atheroma, or from thoracic aneurysm; or to those with the mucous membrane of the respiratory tract in a delicate or inflamed condition, such as young infants, or persons suffering from subacute bronchitis.

The swelling of the mucous membrane of the respiratory tract, through the congestion which sometimes follows the inhalation, may seriously diminish the calibre of a trachea which has already been narrowed by pressure from without, as from an enlarged thyroid gland, or by obstruction from within, as from the membrane of diphtheria; and in all these cases ether should be withheld: as it should also when there is marked cellulitis of the neck, for this external condition is frequently accompanied by some congestion or œdema of the larynx, and this may be so increased by the irritating nature of the vapour as to render it a serious obstruction to respiration. Ether is not well taken, too, when there is much obstruction to respiration in the chest, as by a large accumulation of fluid in the pleura; or in the abdomen, by ascites. In both these instances, if for some reason ether is thought advisable, the limitation of the pure supply of fresh air by a "closed" inhaler should be avoided, and a Rendle's mask should be used.

2. Ether is unsuitable as an anæsthetic for certain operations; as, for instance, when the secretion of much mucus and saliva would be a great hindrance to the operator, such as in the repair of a cleft palate; or when it is desired that the part should be as bloodless as possible, as in operations on the brain, the removal of the thyroid gland, etc. For the performance of some abdominal operations, the deep and free breathing embarrasses the surgeon. In these cases, though the anæsthesia may with advantage be induced with ether, a change should be made, when necessary, to a mixture or chloroform alone.

3. One of the gravest forms of the abuse of ether is that in which the unskilled anæsthetist unduly pushes the drug beyond all necessary limits, and "soaks" the patient. When once the anæsthetic state has been satisfactorily established, the amount of the drug required to maintain it is often very small. Indeed, students constantly need to be reminded that their object should be to use as little of the drug as may be necessary to obtain a state of unconsciousness, satisfactory both for the patient and the surgeon, and not to see how much may be inhaled with safety.

4. Perhaps the commonest form of the abuse of ether is that in which its administration, though eminently suitable for the beginning of the operation, is continued for too long. By this means the patient may gradually become "water-logged" with secretion, and be in a very favourable condition for the supervention of bronchitis on his return to consciousness. Even if bronchitis does not follow, so much secretion may remain in the respiratory tract to be coughed up and expectorated, that the patient will have little rest during part of the most important period of his recovery.

After an abdominal section coughing is not easy for any one, nor is it so when the chest is tightly wrapped in bandages, as after an amputation of the breast; nor is the muscular effort which must be made in coughing likely to benefit the healing of a wound in any position.

Another effect of the administration of ether, either given too freely, or, more generally, for too long, has lately been pointed out, namely, the severe shock which occurs after the removal of the drug. In other words, the stimulating effect of the ether may so mask the shock which the prolonged operation is really causing, and all seem well till the anæsthetist may even have left; but when the patient is back in bed, the shock may manifest itself to such an extent, that the difference between his condition when inhaling the ether and after its withdrawal may be great. This, of course, does not diminish the great value of ether in warding off shock in comparatively short operations, in which it may be expected; but when the operation is likely to be protracted, it is probably better to change, at the right time, from ether to chloroform, or, better still, the A.C.E. mixture; so that a more accurate idea can be formed of the way in which the patient is really standing the operation, in order that, when necessary, the surgeon may be warned in good time that part of the procedure should, if possible, be curtailed, or, at any rate, that no time should be wasted in comparatively unnecessary details.

When the anæsthesia procured by nitrous oxide is for some reason considered insufficient for the operation which is about to be performed, there should arise in the mind of the skilled anæsthetist the question, "Is there any reason in the condition of this patient, or in the nature of the operation, which precludes the use of ether, at any rate for the induction of the anæsthesia?"

The greater safety of ether during the early stages makes this a question which, in the interest of the patient, should be asked on every occasion. Of course it does not follow that the answer will always be in the affirmative; but the safer drug should not be placed on one side in favour of the more dangerous one, without a definite reason upon one of the lines mentioned under the first two headings of the abuse of ether.

Supposing that a start has been made with ether, preceded, of course, in almost all cases by nitrous oxide, and for some cause a change is deemed advisable, the best time for this can only be learned by experience; but it may be taken, as a general rule, that the change to a mixture, or pure chloroform, will with advantage be made earlier in those cases in which the seat of operation is in the thorax or abdomen, than in those in which the efforts of the surgeon are confined to one of the limbs.

The bronchitis and broncho-pneumonia which occasionally follow the inhalation of ether may in almost all instances be avoided by care in the after-treatment of the patient, which should especially be directed to keeping him warm in bed, and out of reach of all draughts of cold air.

If these points receive due attention, there can be no doubt that the value of ether is so great, that without a sound practical knowledge of the advantages and limitations of the drug, no anæsthetist is worthy of the name; nor should the staunch advocates of the merits of chloroform confound the use of ether with its abuse.

THE ASSOCIATION OF MOVABLE KIDNEY ON THE RIGHT SIDE, WITH SYMPTOMS OF HEPATIC DISTURBANCE.[1]

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The words "hepatism" or the "hepatic diathesis" have been adopted by a French writer, M. Glénard, to describe those patients who, from hereditary causes, are liable to functional disturbances of liver. In an excellent preface to his work,[2] Glénard defines certain maladies as occurring in those subjects susceptible to biliary symptoms. A second class is described who may or may not possess this diathesis, but who are the subjects of definite disease of liver. A third class also exists of patients (whether of the hepatic diathesis or not) in whom the biliary symptoms are produced by an entirely secondary cause, and these are due to various degrees of ptosis of visceral organs which induce the hepatic symptoms.

When relieved of many rather unnecessary additions to the nomenclature of disease, we may state his conclusions in plain English, and assert that we are accustomed to recognise the "bilious subject" who, under certain circumstances, is disposed to hepatic attacks of varying severity. These attacks are encouraged by three general causes—errors of diet, an insufficient ingestion of fluids, and certain changes in climate and temperature. In such bilious subjects a continuance of these conditions (one or all) is liable to produce inspissations or concretions of bile, and the more severe symptoms associated with them.

Now, many of these hepatic symptoms may be produced in persons who are not the subjects of a biliary diathesis, by continued transgressions in diet, by alcoholism, want of exercise, and other conditions within their control.

In both classes of cases, the biliary class and those with induced biliary symptoms, as well as in the perfectly healthy subject, symptoms of hepatic disturbance may be produced by a cause which may generally be described as "reflex," depending on a ptosis or displacement of kidney or liver (I leave out of account those patients who are the subjects of definite organic disease of liver). When this secondary cause occurs in a bilious subject, it is very liable to escape notice, as attention is largely directed to the diathesis of the patient.

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[1] Read at the Clinical Society of London, December 13, 1901 (with some additions).

[2] "Les Ptoses viscerales," published in 1899, but comprising previous publications dating from 1885.

The object of my remarks is to emphasise the medical aspect of the condition known as movable and floating kidney, and to say that, even without a coincident ptosis of liver, a displacement of the right kidney is often responsible for profound symptoms of hepatic disturbance.

Glénard is inclined to claim that he has been the first to describe the visceral symptoms connected with the state of ptosis of the kidney. Whether this is so or not, the condition was recognised in England many years before his time, but the surgical aspect has received the more prominent notice. The subject has been elucidated by the excellent writings of Landau, Glénard, Treves, Henry Morris, Clement Lucas, Bruce Clarke, Hurry Fenwick, and others. Many isolated cases have been published of remote visceral troubles, jaundice, digestive ailments, neuroses, and so on, which do not come immediately under the cognisance of the surgeon, but the fact remains that it has been the habit to regard movable kidney as chiefly a surgical ailment, and usually remediable only by operation.

This view is too one-sided, and I do not hesitate to say that for every case that applies to a surgeon for relief, at least a dozen cases apply to the physician in the first instance, though the frequency of the condition is by no means universally recognised, and, if not specially looked for, is often overlooked.

The displacement of kidney is responsible for so many common ailments, that I am accustomed, in every case of hepatic or gastro-intestinal disturbance that has resisted treatment, to examine the abdomen for movable kidney, and I have been surprised to find how commonly my efforts have been successful.

The cases of movable kidney chiefly occur in women. In my notes I can only discover two cases in men, while I have seen at least fifty cases in women in recent years. Glénard publishes elaborate statistics as to the frequency in men and women who are the subjects of dyspepsia and visceral troubles. He states that 2·7 per cent. of men and 22 per cent. of women suffering from the above ailments have a floating or movable kidney. These figures do not differ much from those of Ewald, Landau, Mathieu, and others—the highest figure for women being 27 to 28 per cent. of dyspeptic subjects. What is not stated (except by Landau) is that the large majority of cases of movable kidney occur on the right side. When the left kidney is displaced, it is more common for both kidneys to be affected.

There are four common causes of movable kidney—(1) tight-lacing in women; (2) violent exercise, falls, or sudden muscular exertion; (3) excessive and frequent child-bearing; and (4) any cause which produces wasting or absorption of fat in the mesentery, abdominal parietes, or in the tissues around the kidney, in a patient hitherto well nourished.

A fifth and less common cause is the removal of an abdominal tumour, ovarian frequently, or a large uterine fibroid, which has distended and stretched the abdominal walls, and is followed very naturally by a prolapsus and ptosis of many of the visceral abdominal organs.

The diagnosis of movable or floating kidney is not always easy. In the lesser degrees of mobility it is well known that frequent examinations of the abdomen may be made without feeling the kidney, though there may be convincing reasons for believing that it is movable. This variability of the position of the kidney adds an element of obscurity to the diagnosis, and it is all the more needful to lay stress on the various symptoms which are characteristic of the condition.

An enlarged and distended gall bladder sometimes simulates the shape and form of a kidney. It is mobile, but the movement is from side to side, and though it may move downwards with inspiration, it never suddenly slips from the fingers up into the hypochondrium, as does a movable kidney.

In a clinical lecture, Treves[1] has called attention to a displacement and irregularity of the right lobe of the liver, in which part of it is of exaggerated size, and hangs down over the portion of the kidney in the right hypochondrium. This is known as Riedel's lobe, or the floating lobe of the liver, and the author insists that it is frequently mistaken for a floating kidney.

I have very little experience of the condition, though in one case that I have seen the mobility was far greater in the lateral than in the vertical direction, and I considered that it was possible that the tumour felt was liver and not kidney. The case responded to treatment, and I had no opportunity of verifying the diagnosis. Lastly, the severe symptoms due occasionally to a movable kidney have been attributed to an appendicular colic and to appendicitis. Enlargements of the kidney due to disease, tuberculous, cancerous, hydronephrosis, etc., must of course be left out of the question.

When the subject becomes emaciated and debilitated, it sometimes occurs that a movable kidney is mistaken for a malignant tumour. If the tumour is freely movable, extreme caution should be exercised before such a diagnosis is made. A movable kidney sometimes coexists with an enlarged gall bladder, or a bladder distended with gall stones. The symptoms may be described as *subjective* and *visceral*.

1. The *subjective symptoms*, which in all cases are more frequent when the kidney is movable on the right side, are common

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[1] *Lancet*, London, May 12, 1900

to displacement of kidney on both sides. They are—a dull, aching pain or weight in the hypochondrium, with dragging or tearing sensation, especially upon movement of the arms or shaking; pain, shooting upwards to the loin, scapular region, or arm, or downwards to the groin, the inner side of the thigh, or generally in the course of the crural or sciatic nerves. Occasionally, on the right side, pain is felt in the right iliac fossa.

Hyperæsthesia in the hypochondrium or loin, with tender spots, is often complained of, or numbness or tingling of the affected side. All these subjective symptoms are aggravated by movements such as that of raising the arms, or by shaking induced by carriage exercise, railway journeys, bicycle rides, lifting of weights, etc. Deep inspiration or cough will then exaggerate the pain.

Sometimes, in addition to the local symptoms, the patient (if a woman) becomes neurotic, hysterical, or hypochondriac, but this is rarely the case except in a subject of neuropathic type.

2. *Visceral symptoms.*—So large a proportion of cases seem on the right side, that very little is to be said about *left kidney* displacement. The subjective symptoms may occur when the right or left kidney is displaced. But, with regard to the left kidney alone, I can only say that, in the very few cases I have observed in which visceral symptoms occur, the symptoms are comparable to those of an epigastric fatty hernia. They are chiefly gastric, and consist of nausea, rarely vomiting, with gastric disturbance, chiefly dependent on dilatation of stomach and its concomitant symptoms. All the rest of the superadded and remote visceral symptoms occur when the ptosis of kidney is on the right side; and as this is the common and frequent condition, my further remarks have reference to the movable kidney of the right side.

Hepatic symptoms are of three kinds—

(*a*) General biliousness, in which the patient complains of furred tongue and bad taste in the mouth in the morning, with sometimes offensive breath, symptoms of dyspepsia, flatulence, heartburn, and acidity, distention of stomach, with weight and oppression after meals, epigastric pain either soon after food or within an hour or two, more rarely vomiting; morning headache, sometimes of great severity, muscæ volitantes, disturbed bowels, with either loose constipated motions, with pale or even white evacuations, high-coloured urine, with deposit of urates.

(*b*) Attacks of colicky pain, simulating bilious colic, but not usually of quite the same severity. These attacks are rare, and accompanied by great distension of stomach. During the attacks there is much tenderness in the hepatic region and epigastrium, but there is not the same soreness left behind, when the attack has passed off, as is found in cases of true biliary colic. I believe these severe attacks of colic to be similar to those described by Dietl, and often known by the name of Dietl's crises. They are attributed by the author (who first described the attack in 1864) to recurrent appendicitis; but other writers believe that they are due to movable kidney, which produces twists or kinks in the renal vessels. The symptoms described are those of sudden, severe abdominal pain, with chills, nausea, vomiting, fever, and collapse. The urine is often high coloured, and blood or pus may be present. Such cases have been mistaken for those of gastric ulceration. The main feature is that a movable right kidney is present. In both of these classes of cases it is not uncommon for the patient to suffer from profound nutritive disturbance. The face may be sallow or even cachectic in appearance. The muscles are wasted and it is not surprising that, when a freely movable tumour is detected, that the diagnosis of malignant disease has sometimes been made.

(*c*) Jaundice is occasionally noted in cases of movable kidney on the right side. This may occur with very little pain, or there may be attacks of colicky pain simulating gall-stone colic.

Three interesting cases of jaundice from movable kidney were published by Maclagan.[1] In all these cases it was supposed that the patient was suffering from gall-stone colic. The gall bladder was in each case distended, but an operation failed to detect any obstruction from gall stones, and the fixation of kidney in every instance entirely relieved the symptoms. The right kidney was involved in every case. Since this paper was read at the Clinical Society, Mr. J. Hutchinson, jun., has published a most interesting article on "Floating Kidney as a Cause of Jaundice and Hepatic Colic."[2]

Whether by an hepato-renal band or no, the existence of which does not seem to be positively confirmed, there seems to be no doubt that, when the kidney descends, traction is exerted upon the duodenum with stretching of the common bile duct, and an obstruction to the free passage of bile.

Landau, who has written an exhaustive work on the symptoms of movable kidney, does not consider that jaundice can be primarily induced by pressure or traction on the duodenum. He regards the occasional accompaniment of jaundice as due to some coincident catarrhal attack, or to the pressure of gall-stones.

The various symptoms attributed to movable kidney bear no relation to the extent of mobility. Sometimes a kidney will be so freely movable as almost to be described as a floating kidney, and yet produce no symptoms of disturbance. More often the kidney is only occasionally detected, and yet produces profound reflex symptoms.

This leads me to say that the anatomical divisions described by Glénard are too arbitrary and illusory. He describes three degrees of mobility, according to whether the lower border of the kidney alone is felt, or whether the kidney descends with inspiration only, or also with expiration. In the third class, the whole contour of the kidney is felt, including its upper border, which can be clearly defined. His fourth class corresponds to the cases which we know as floating or wandering kidney. Any of the above degrees of kidney displacement may or may not produce symptoms—sensory, remote, or visceral; and for practical purposes it is more important to define the classes of cases that occur on grounds that are partly anatomical, but that depend on the symptoms produced, and their tractability. I prefer to describe three classes of cases:—(1) Cases of uncomplicated ptosis of right kidney producing remote or reflex symptoms, or traction upon the duodenum. (2) Cases in which the renal condition is accompanied by a coincident ptosis of liver. (3) Cases in which the renal ptosis is only part of a general enteroptosis.

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[1] *Lancet*, London, January 6, 1900.

[2] *Practitioner*, London, February, 1902.

Several views prevail as to the connection between right kidney displacement and hepatic symptoms. These may be shortly defined, and they attribute the cause to pressure, traction, or reflex conditions. I feel very doubtful whether the kidney, however movable, produces obstruction to the outflow of bile by pressure. Its mobility is more often in the downward and vertical direction, and the variability of position almost contra-indicates any permanent results. I am strongly inclined to attribute the hepatic incidents to two causes—traction and reflex conditions. Mr. H. Morris believes that the middle portion of the duodenum is the object of traction in extremely movable kidneys, and that by this means obstruction to the passage of bile is produced and severe bilious disturbance. I am inclined to lay equal stress on the reflex condition, except in cases of jaundice. It will be remembered that the pneumogastric nerve on the right side supplies the liver, the solar plexus, and the right kidney. It is easily conceivable that the traction on peritoneum and subcutaneous tissues containing these branches of the pneumogastric may produce profound disturbances of hepatic secretion. I do not venture to dogmatise on the question, but I throw out this suggestion as a possible explanation.

I now turn to the special object of my paper, which is to call attention to the symptoms produced by right kidney displacement, and to insist that there are certain elements in the condition which should lead to immediate diagnosis. In the slighter degrees of ptosis of the right kidney the hepatic symptoms are often paramount, and two facts should lead to the suspicion of a movable kidney, if no tumour is felt.

1. First, the symptoms are exceedingly intractable; all ordinary remedies, including mercurials, alkaline mixtures, etc., may be administered, and seldom afford any relief to the patient. This is so much the case, that when I am asked to advise any one with severe hepatic symptoms, short of jaundice, and I find that the ailments do not yield to ordinary treatment, I always suspect that

the hepatic condition is kept up by the reflex disturbance of a mobile and displaced kidney, and redouble my efforts to detect it.

2. In almost all such cases, shaking and exertion, such as I have described above, precipitates a bilious attack.

Occasionally, exertion produces severe headache, sometimes an attack of hepatic colic, or severe symptoms similar to Dietl's crises (above described), but more frequently a severe bilious attack. Mercurials and hepatic treatment usually act temporarily in relieving the attack, especially if the patient at once takes to her bed and to the recumbent posture. Until the kidney is kept in position by a belt, or (in condition of excessive mobility) by operation, the attacks recur, and are irremediable by ordinary remedies.

It will be remembered that in most cases of so-called sluggish liver, with imperfect biliary secretion, exercises which involve shaking, such as horse exercise, are usually beneficial.

In the present instance the reverse is the case.

The following cases illustrate the points upon which I desire to lay stress:—

Case 1.—Mrs. W., æt. 59, consulted me in 1895. She had been a strong woman, without ailments, until her husband was taken ill with pneumonia, four years previously, and she believed that the nursing and anxiety, together with the great heat abroad (where she and her husband went during his convalescence), had completely upset her liver. From this time she began to suffer from epigastric pain an hour after meals, abdominal distension, and constipation, with pale evacuations. These symptoms had been much intensified during the previous year, and she complained of rapid wasting, and much pain in the right side and back, sometimes shooting up from the spine to the right scapula. A freely movable tumour had been discovered on the right side of the abdomen, and she had been told that it was of a malignant nature. During her illness she had been freely treated with various gastric and hepatic remedies. The appearance of the patient was that of an emaciated woman, with sallow complexion, almost suggestive of a malignant cachexia; and the fact that her mother and sister had died of cancer of the breast seemed to confirm the previous diagnosis. She complained of much uneasiness, pain, and distension after food. The tongue was furred, the breath a little offensive, and she presented all the symptoms of a person suffering from biliary disturbance, with imperfect hepatic secretion. She was actively treated with small daily doses of mercurials, with a saline purge in the mornings, and with alkaline mixtures of gentian and taraxacum, and ordered a belt to support the displaced kidney. No amelioration in her symptoms occurred until the belt was worn, and, owing to some little trouble in adjustment, this did not take place until several weeks after her first visit. After wearing the belt the pain in the right hypochondrium rapidly subsided, the dyspeptic symptoms improved, and the patient began to gain in weight. I need not closely describe all the symptoms, but suffice it to say that Mrs. W. soon regained her natural healthy colour, and by the end of the year, some six months later, was in perfect health, and about a stone and a half heavier than before. She has remained well until the present time, *i.e.* for some six years, and has continuously worn the belt during the day-time. I hear occasionally from her, and she is in good health, without any complaint.

Case 2.—Mrs. B., æt. 45, came to me first in 1894. She has no children, is a highly neurotic subject, and comes of a family all of whom suffer in one form or another from biliousness. Her symptoms were those of flatulent dyspepsia, with great oppression and distension after meals, and troublesome constipation with bleeding piles, pale evacuations and much depression. She then presented the appearance of a healthy woman suffering from general hepatic disturbance. She improved under treatment, but was never quite well, complained frequently of headaches in addition to the above symptoms, and of a sense of a lump in the right hypochondrium. I examined the abdomen on several occasions, but could never detect any enlargement of liver or gall bladder, or any abnormality. Mrs. B. had been accustomed to take very long walks and bicycle rides, in order (as she said) to keep the liver in order, but latterly had been unable to do so because the exercise appeared to bring on pain and biliousness. I have records of several visits and examinations in 1894 and 1895. In 1897 she complained of more discomfort on the right side, pain and numbness in the right hypochondrium, and in the right scapular region, shoulder, and arm, not apparently increased by food or by movement.

On this occasion I was able to detect a movable kidney, and I ordered an abdominal belt with a pad to keep the kidney in place. This at first caused discomfort, owing to the pad being in the wrong place, but, when set right, very great improvement in the hepatic symptoms occurred. At this time her attention was concentrated upon certain nervous symptoms connected with the menopause, and, finding the belt a little irksome, she discontinued its use. I did not see Mrs. B. again until this year (1901). The catamenial periods ceased some time ago, but the hepatic symptoms had become aggravated. She had reverted to the old treatment for the liver, and without any relief. I found the right kidney even more freely movable than before, and, without altering medicinal treatment, I advised a return to the abdominal belt, seeing myself that the pad was in the proper place. Relief was immediate, and there has been no return of biliousness since September, and the patient expresses herself as feeling quite well, and better than she has been for a long time past.

In this case the liver ailments had been troublesome for years, and I was at a loss to explain why the patient never fully responded to medicinal remedies associated with careful dietary and régime. No really satisfactory improvement took place until the displacement of kidney was discovered, and a belt worn to keep it in position.

No typical or characteristic pain of displaced kidney was ever present, but, on the two occasions mentioned, improvement took place so rapidly after the application of a belt and pad, that I was forced to the belief that the hepatic symptoms depended solely upon the kidney condition.

Case 3.—Mrs. H., æt. 75, suffered in 1879 from gall-stone colic, and had many attacks until the year 1880, and no attack since. In 1890 she suffered from what was described as a chill on the liver. She was in bed for fourteen days, and had severe pain, as in the previous attack, but no jaundice, and has not been free from pain in the right hypochondrium since. It was thought that she was still suffering from gall-stones, and she consulted several well-known London doctors, and was sent under advice to Vichy and Carlsbad. She received no benefit from this treatment, and still suffered from great pain in the right hypochondrium, constant during the day, but subsiding at night. I saw Mrs. H. in 1900. The pain was apparently chiefly in the region of the gall bladder, and rarely shifted very far from this position. Mrs. H. complained of dyspepsia, of flatulence and distension after meals, with bad taste in the morning, and constant extremely pale motions. She had lost weight considerably. The face was sallow, the body generally extremely thin. I could discover no departure from the normal condition in any organ, and no abdominal tenderness, but there was a large rounded mass in the right hypochondrium, very freely movable, which easily slipped under the ribs upon pressure. The urine was of high specific gravity, and contained urates but no bile. I considered the tumour in the right hypochondrium to be the kidney, and an abdominal belt gave extreme relief; but the pain and hepatic symptoms, though ameliorated, did not subside until the patient went this summer to Harrogate and took the waters there, under the care of Dr. Black. I have recently heard that all pain has disappeared, and that the patient is free from dyspepsia and hepatic symptoms. Pain and symptoms of discomfort and indigestion recur if she does not wear the belt for movable kidney.

In this case the kidney was so freely movable that I seriously considered the question as to whether an operation might not be advisable to fix the kidney in position, but in consideration of the advanced age of the patient, and her refusal of operation, I decided to send her to Harrogate, in spite of the discouragement of the previous Vichy and Carlsbad treatment.

The result has proved entirely satisfactory.

Case 4.—Miss V., æt. 33, had a serious illness six years ago, in Switzerland. She was taken ill suddenly, with high temperature, shivering, and vomiting, with passage of dark or black urine. She was told that she had congestion of the kidneys. She was ill for fourteen days or more, and then gradually recovered in the course of the following six weeks. Miss V. has not been really well since. She has suffered from indigestion and flatulence, constipation with pale evacuations. Milk foods and fat in any form have invariably upset her. Any violent exertion produces severe headache, vomiting, prostration, and on each occasion the urine has been dark and sometimes blood-stained. Such an attack occurred five years ago, after playing a game of lawn-tennis, and on many occasions since, after long railway journeys or much fatigue. Miss V. came to me in October of this year (1901). She had recently returned from Switzerland, and, after the long journey and a day of shopping in London, an attack of pain with aching in the right loin came on, with indigestion, fulness and distension of stomach after food, headache, and very pale stools. The kidney on the right side was freely movable, and descended with inspiration. Its upper border could not be felt. The urine was dark red-brown in colour, contained a cloud of albumin and a few red blood corpuscles, but no casts. It was of high specific gravity, 1022. Miss V. was ordered absolute rest in the recumbent position, and appropriate diet, and the symptoms gradually subsided. I have not allowed Miss V. to resume her ordinary avocation or to take more than very gentle exercise until she was fitted with a belt and pad to support the right kidney. The indigestion and hepatic symptoms had disappeared under the influence of rest and hepatic treatment even before the belt was applied. Now that she is wearing the belt she is able to walk about and is gradually increasing the amount of exercise. So far Miss V. has had no return of pain or any discomfort. The belt is comfortable, fits well, and affords good support to the kidney.

Case 5.—Mrs. G., æt. 59, came to me in January 1901 with a history of gastric symptoms since the previous October. She complained of epigastric pain occurring some two hours after food, with nausea and flatulence, and confined bowels. The liver was disturbed, the mouth uncomfortable in the morning, with bitter taste and furred tongue. The stools were very pale in colour. She also suffered from insomnia and bad dreams.

I found that her life was a sedentary one, as she spent most of her time in literary work, but she had been much hindered by her ill health and also by certain nervous symptoms, alternating sensations of heat and cold, intense epigastric pain if she was exposed to the heat of a fire, and fleeting pains in the right loin and hypochondrium, which had no relation to food or movement. She had been under treatment for some months without any relief. The only abnormality that I could find upon examination was a freely movable kidney on the right side. I treated her with small doses of mercurials, followed by a morning saline purge and by an alkaline mixture of gentian with taraxacum and sulphate of soda, and at the same time I ordered an abdominal belt with pad to keep the kidney in position. When I last saw her, in March last, she was free from dyspepsia and liver disturbance, and had lost her pain. The relation between the displacement of kidney and the pain does not appear so clearly in this case, but the fact remains that the patient had been treated for the liver for some months without any amelioration either of pain or biliousness, and that until she was fitted with a belt the symptoms did not begin to amend.

Case 6.—Mrs. S., æt. 57, visited me on October 31, 1901. A highly neurotic patient, complaining of a pain in the right lower scapular region, not severe, but very persistent. She was in a nervous, agitated condition, because the pain had continued for several days. Her mother and her husband had died of cancer, and it needed great persuasion to induce her to believe that the pain (which she confessed was slight) was not of a serious nature. She had some gastric catarrh, with pain following each meal immediately, a white, furred tongue, and distention and flatulence, with some heartburn and nausea after meals. She described herself as a very bilious subject, but the symptoms of disturbed digestion had appeared after lifting a very heavy weight some five years previously. Before that time she had never suffered from any ailment. Last year, at Brighton, she was very ill, with sallow complexion and offensive breath and taste in the early morning, and pale stools. Since then, there had always been a tender spot in the right hypochondrium.

Upon examination, I found the kidney on the right side descended below the ribs, with deep inspiration for some four inches. I ordered small doses of a mercurial, with a saline aperient every morning, and an alkaline mixture of bismuth and soda, with a few grains of bromide. The patient is always relieved by lying down, and is free from all tenderness and discomfort at night. She is now fitted with an abdominal belt to keep the kidney in position. Not the slightest improvement in symptoms resulted until the belt was applied. Since this time there has been no pain and no tenderness. The gastric symptoms have improved, and there is no longer uneasiness in the right side. The motions have resumed a normal appearance, and the dyspepsia has almost disappeared.

In the cases I have just related, the hepatic symptoms appear to have been entirely dependent upon the displacement of the right kidney. In Cases 1, 4, and 5 there was no reason to think that from constitution or heredity the patient was liable to bilious disturbance. In all these the liver ailments had been actively treated for a very considerable time without relief. I do not think that the medicinal treatment I ordered differed materially from that previously given, but in each the relief afforded by a belt and pad, to replace the movable kidney, afforded marked and almost instant relief.

I now have to describe two cases which I regard as intermediate between the simple condition movable kidney and the more serious condition of complete enteroptosis known as Glénard's disease:—

Case 7 is that of a lady, Mrs. N., æt. 51, the widow of an Indian officer. She had lived some years in India, but had been obliged to return to England on account of severe headaches. These all dated from a severe blow in the right loin, caused by a fall from her horse. She had one child only. For many years since leaving India Mrs. N. has suffered from headaches, lasting from fourteen days to three weeks. The duration of these has diminished in recent years, but when they recur they are of great violence, and Mrs. N. has to lie in a dark room for three or four days. The attacks are always associated with digestive disturbances, muscæ volitantes, aberrations of sight, and often with violent retching. During these periods the evacuations are invariably pale in colour, and the bowels confined. There is frequently a metallic taste in the mouth on waking. The headaches usually commence in the early morning, and are accompanied by great prostration, and by a dull aching pain in the right hypochondrium.

Any exertion or jolting in a carriage, or a railway journey, is followed by a feeling of excitement, and results in a headache on the succeeding morning. The only remedy that relieves the headaches in the slightest degree is a dose of 3 or 4 grs. of calomel, combined with abstinence from all food. Mrs. N. came to see me in April 1900 with the history that headaches were becoming more frequent and more severe.

I examined every organ carefully, with a view to eliminate any other cause. The fundus oculi were normal, the chest and abdomen and urine were healthy. But the right kidney was so freely displaced that its entire contour could be felt. An abdominal belt and pad produced considerable relief to the headaches, but they still recurred, though at longer intervals, and with diminished severity. Still, the condition was not satisfactory, and I advised Mrs. N. to go to Harrogate. The treatment there in September 1900 had no permanent effect, and the symptoms during the autumn and the early part of this year were practically unaltered. I therefore advised the patient to have an operation to fix the kidney in position. Early in July, Mr. Pearce Gould operated. He found that there was some ptosis of liver as well as kidney, though the liver edge could not be felt below the ribs before the operation. The kidney was fixed in position, and during convalescence Mrs. N. lost all her symptoms of hepatic disturbance. Previous to operation, she had been afraid to eat, and had entirely avoided eggs and milk and fat in any form. Before leaving the Nursing Home, the patient was able to eat anything, and milk diet produced no dyspepsia. For some two months Mrs. N. remained practically at rest, and had no unfavourable symptoms. At the end of this time, she began to move about and to take a certain amount of exercise. Her only inconvenience was in regard to two small stitch sinuses, which were slow in healing.

Gradually, as the exercise was increased, headaches have begun to return, and, though not so severe, the same complaint is found of headaches produced by jolting, shaking, or prolonged walking. The kidney is now felt below the ribs on the right side. It can still be slipped up into the hypochondrium, but it does not move, as before, with respiration, and is not nearly so movable as before the operation.

The patient is now fitted with a pad, in order to give additional support.

Her brother, who is a doctor, informs me that the headaches and other symptoms, though they occasionally recur, are not nearly so severe as before operation. No doubt the coincident ptosis of liver has some bearing upon the continuance of slight symptoms of hepatic disturbance.

CASE 8.—Miss R., æt. 40, suffered two years ago from dilatation of the heart, after very extreme and long bicycle rides. Since then she has complained of periodic attacks of gastric pain, worse during the monthly periods. The pain occurs soon after food. There is flatulence, but no nausea or vomiting. She has never been a bilious subject, is highly neurotic, and the attacks of pain, which return every few days, entirely prostrate her. The pain is usually brought on by exercise, and especially by a shaky drive, a railway journey, or by much physical exertion. When I first saw Miss R. in consultation, she was suffering from one of these attacks of epigastric pain, with sensation of weight and oppression after food. The bowels were disturbed, and the evacuation extremely pale in colour. I found the stomach considerably dilated, the complexion was sallow, though not icteric, and the urine high-coloured, and containing an excess of urates, but no bile pigment. The liver could not be felt below the ribs, and the hepatic dulness was normal in area. An abdominal examination revealed no abnormality by palpation, though percussion and auscultation showed a dilated stomach. Miss R. improved slowly under treatment by gastric sedatives, mild mercurial doses, and daily lavage of the stomach. But, on returning to habits of health, she still found that any exertion or exercise produced pain, referred to the epigastrium, with symptoms of biliary disturbance. During the last two years the patient's weight has diminished by about a stone. I first saw Miss R. in May of the year 1901. In September, for the first time, a movable kidney was detected, though frequent examination had failed to find it. An abdominal belt was ordered, with pad, and since then I hear that there is great improvement, though the gastric dilatation has not entirely subsided. Miss R. is much more free from pain, and finds the abdominal belt a great relief.

Case 9.—Mrs. D., æt. 31, has been married for twelve years, but has no children. She has never been in robust health, and has always been liable to bilious attacks. Eight years ago she suffered from an attack of gall-stone colic, and a gall-stone was passed. Three years ago she was operated upon for a large ovarian tumour on the right side. She has recently been sent to Harrogate for relief of hepatic symptoms, which have been continuous for more than a year. These symptoms have consisted of a dull aching pain in the right hypochondrium, extending to the right loin, and down to the groin and inner surface of the right thigh. Pain is intensified by breathing, or talking loudly; also by lifting any weight, or by raising the right arm. It is relieved by the recumbent position, but sometimes occurs in bed at night. Mrs. D. is very constipated, and passes pale-coloured stools, sometimes white in colour. The urine is concentrated, and contains an excess of urates. The digestion is disturbed, and there is flatulence and oppression, but no pain after food. There is no sickness, but occasionally nausea and acidity. Two months ago she had a severe attack of colicky pain in the right side of the abdomen, accompanied by great flatulent distension of stomach. Dr. Black, who saw her at Harrogate, did not consider that this was due to gall-stone colic. Mrs. D. has returned from Harrogate without much improvement to her pain. I found the right kidney freely movable, but on my second examination I have been unable to detect it. An abdominal belt with pad has been ordered, and Mrs. D. has now worn it for some weeks. She experiences great relief from the support, and during the past two or three weeks has had little or no pain. The time is still too short to tell whether this improvement will be permanent. The cause of the condition is probably the removal of the large ovarian tumour (which the patient describes as having been as "big as her head"). This evidently distended the abdomen, and its removal would be likely to induce a ptosis of kidney, and possibly of liver also. The liver cannot be felt, and if the above symptoms are not relieved by pressure to replace the kidney, it will not be considered as improbable that the liver shares in the same degree of mobility.

Case 7 is an evidence that there may be ptosis of liver present which is not revealed by any process of examination.

The above cases have been selected from a considerable number with a view to illustrate several different types.

With regard to treatment, I find that I differ from the expressed views of some surgeons as to the efficacy of an abdominal belt and kidney pad. At a recent meeting of the Medical Society, Mr. Henry Morris read a most valuable paper on the surgical aspect of movable kidney. I was impressed by his statement that he had found pads and belts to be chiefly of advantage when there was general enteroptosis present, and he inferred that, for movable kidney alone, operation was the best course of procedure.

My experience differs somewhat from this view. Many of the lesser degrees of ptosis of kidney occur in patients who never come, in the first instance, to the surgeon for relief, because the characteristic pain is not the most prominent symptom, and the chief attention is directed to the medical aspect of the case. The cases I have described afford an illustration of this. In some of these the kidney has been kept in position quite efficiently by a belt; but in those with very free mobility, and associated with ptosis of other organs, the relief afforded has been very partial. The physician must himself see to it that the pad is placed in a correct position, for if imperfectly applied, I agree that it will do infinite harm and aggravate the condition. In severe cases, rest in the recumbent position may be of great benefit (as Dr. Maclagan has stated at the discussion on this paper at the Clinical Society), if this treatment is supplemented by ample feeding. In these cases the object is to support the kidney by a natural pad of adipose tissue.

It is quite obvious that it is the mild degree of mobility of kidney that is apt to be overlooked, because, as in some of my own cases, an examination has frequently been made without the discovery that the kidney is displaced. It is these cases to which I have specially desired to call attention, and I may be allowed to repeat that intractability of hepatic symptoms, combined with their exaggeration upon excessive exertion, should always lead to the suspicion that the kidney on the right side is movable, even though no special or characteristic pains are present.

MASSAGE AND MOVEMENTS IN HEMIPLEGIA.

By DOUGLAS GRAHAM, M.D., *Boston, Mass., U.S.A.*

OF all the discouraging cases that come to us for relief, there are few more hopeless than the hemiplegics. And yet, when we are so fortunate as to see one recover under our care, we hope that we have had something at least to do in producing such a favourable result; for the patient is apt to give us all the credit, though we may be modestly and silently loth to accept much of it.

The benefits that may result from massage or any other remedial measure in disturbances arising from morbid changes in the central nervous system, or in any part of the body, will depend more on the nature of these changes than on the merits of the treatment, however appropriately and skilfully it may be employed. So many variations are seen in the course of paralyses of so-called organic origin, that the influence of massage in modifying these is difficult to determine, even if it were judicious to make use of this treatment from the commencement. When paralyses of central origin has come on suddenly, I prefer to abstain from the use of massage until the perturbation in general has subsided, and the patient has become somewhat accustomed to his unnatural condition. But, in the meantime, while thus waiting to spare the nerve centres any supposed extra commotion, the peripheral pathological changes are gaining ground, which later may only be imperfectly overcome. These are, interference with the supply and return of the circulation, owing to the accelerating influence of muscular contraction and relaxation being absent or diminished; and, as a result of this, variation of temperature, usually lowering, and passive hyperæmia or ischæmia; hypertrophy of interstitial connective tissue, with, in time, subsequent cicatricial retraction, giving rise to contractures and atrophy of the muscular fibres; formation of adipose tissue or fatty degeneration—in a word, vasomotor and trophic disturbances. These are all rational indications for the use of massage, either as a preventive of such changes, or as a palliative of them when they have taken place. But if the nerve centres are impaired beyond recovery, or secondary pathological changes have occurred, the prospect of benefit cannot be encouraged.

My own experience of massage in a number of cases of paralysis may be briefly stated by saying that, in the absence of severe pain, obstinate contracture, or tonic spasms, this agent has proved useful in improving the circulation, temperature, and comfort of the parts affected. When in paralysis of spinal or cerebral origin recovery follows under manipulation, we had previously supposed that the central disturbance had entirely passed away, and that the force of habit was the main factor that continued the external manifestations of inaction; and thus massage would have served a useful purpose for diagnosis as well as treatment. But the more recent experiences and opinions of Professor Zabludowski, and others well qualified to judge, teach us that it is possible, by means of massage and gymnastics, to educate other parts of the brain to take the place of the injured ones, by arousing psycho-motor impulses in the formation of new associations and combinations; so that we need no longer regard paralysis of either central or peripheral origin from the hopeless view that we formerly did.

However that may be, when the causative conditions have ceased, paralysed muscles will not at once resume their former natural condition. Massage, passive and resistive movements, restore them to a sense of existence, enable them to recognise the power they still possess, and educate this to a higher degree; and, at the same time, such treatment affords the *only* means of judging of the capabilities of the patient, and of telling him how to use them. Sometimes the patient will make better motion against the resistance than without it. This seems to give a sense of support and consciousness of power. Interlocking the fingers of one hand with the other, so that the well arm can raise the paralysed one, is a most excellent device, encourages the patient, and educates the unimpaired centres to supplement the deficiency of the injured ones. This should be repeated regularly —six to twelve times three times daily.

Massage, if used early in these cases, would diminish the evils of inactivity upon the circulation and nutrition, and keep the muscles in a state of readiness for voluntary contraction. It is when there is only partial impairment of motion that massage will be likely to lead to recovery; and, when improvement or recovery does follow, it will be difficult to determine whether the recent exciting cause of the trouble has passed away, or whether we have succeeded in training the other parts of the brain to do the work of the injured ones. In either event, we ought to give the patient the benefit of the doubt by a vigorous persistence and long continuance of the treatment by massage and gymnastics.

CASE 1.—Mr. L., æt. 58, had been a vigorous, healthy man. He had been much worried with reverses in business. While at breakfast one morning he had an uncomfortable sensation in his head, with slight loss of motion in the left arm, leg, and side, which gradually increased for two or three days. He kept in bed for four weeks, and for six weeks afterwards the affected parts were quite helpless, and his face was drawn to one side—the left. Improvement was gradual, and at the end of a year, when he came to me, there was a lack of control over the arm and leg, with stiffness and awkwardness in using them; but if he slipped on the side-walk he could use either with alacrity to regain his balance. The patient had massage nine times in three weeks, and the result was that he got rid of uneasy feelings in his head, his power of endurance and freedom of motion greatly increased, his digestion, which was previously feeble, became strong, and he looked more robust, bowels became regular, and the urgent desire to urinate disappeared. The arm and leg could be used almost naturally. At first he felt remarkably well after the massage, as if moderately stimulated. Later, he experienced an agreeable languor from manipulation, and he thought he was being too much "mesmerised."

Case 2.—Three months ago there came to my office a patient, æt. 36, and weighing 150 lbs. With the aid of a cane she walked rather awkwardly, in a manner characteristic of hemiplegia. Seven months before this I met her out walking, the picture of health, and two days later she was attacked with hemiplegia. It was about 4 o'clock in the afternoon, when she was sitting, and she tried to get up for something she wanted, and found that she could not stand. She was not unconscious, but somewhat dazed. She was put to bed, and later she discovered that the left leg was numb, and she had difficulty in moving it, and the arm and side. The attack was preceded by severe headache for a day or two, with boring and buzzing and feelings of pressure in the head, which lasted for four hours after the shock, and then disappeared. She got up the following morning, but soon went back to bed again, and stayed there for three months. A week after the attack, speech and deglutition became impaired for several days. Speech returned suddenly, but she stammered for several weeks. She did not lose control over the bowels and bladder, but the bowels had to be moved by injections, and she passed but little urine. For three days she was fed on liquid diet.

Before this attack she used to walk often in her sleep. Two years before it, she walked quite a long distance from home one night, and went out on the rocks at the sea-shore. A dog barked and woke her up, and then the rocks hurt her feet, so that she had difficulty in walking back upon them. One night during the three months that she was confined to bed, she read a long article aloud in the dark, and made uncomplimentary but thoughtful remarks upon it. Her husband and the nurse who heard her thought it was something that she had committed to memory and was reciting.

When she came to me she had headache nearly all the time on the left side in the parietal region, and a numb feeling on the right. She was also subject to nervous spells, which occurred from once a day to once in two weeks. In these the right leg would tremble so severely, that she thought it would dislocate itself at the hip-joint. If she did not succeed in getting asleep soon in one of these spells, her headache would increase, and she could read and write in the dark, though she had no recollection of what she had done. For two months there was almost complete loss of motion and sensation in the left leg.

She had been treated for some time by iodide of potash and strychnia, and had improved much. The strength and motion of hand and arm were little less than normal; of the thigh, for flexion and extension, abduction and adduction, only about one-fourth of normal; of leg below knee, for flexion and extension of foot, strong and natural, which was in marked contrast to the behaviour of the motion of the thigh. Sensation perfect everywhere, except a little dull on outside of the thigh. Patella reflex exaggerated. Pupils normal to light and distance. Pulse 72, and heart sounds normal, though she reminded me that I found something the matter with her heart a year before, which disappeared while she was a subject for the class in massage, and with that disappeared also shortness of breath, and difficulty of going up stairs. She could go up stairs and down, one step at a time, not step about in the natural way, when she came to me.

The treatment I gave her was massage and resistive movements, and after two visits for this purpose she could push with the leg much more vigorously. After six visits in two weeks, she pushed and pulled the leg and thigh with vigour that seemed equal to normal; but there was a slight lack of endurance to the upward pull of the thigh, done by the psoas magnus and iliacus internus. Inversion and eversion of the thigh against resistance had also vastly improved. She walked naturally, and she no longer carried a cane for support. She visited me twice the following week, and at the end of the second visit this week she dressed herself in three minutes, and in twelve minutes more she got her train at the North Union Station, a feat that any of us might envy, for it meant crossing two streets, descending a flight of stairs, and a ride of a mile in the subway cars. Two visits more the following week seemed sufficient to confirm the improvement gained in motion, for she could then go up stairs two steps at a time, and run on a level. But as her head and neck were not yet comfortable, she came to me once a week, for three weeks longer, for special massage of these regions, which were tense and indurated. The tissues here became of natural suppleness and elasticity, and the headache entirely disappeared. Her whole period of treatment with me was seven weeks, and at the end of that time, and now also, she is so well, I trust, she will get over it.

This is a case that would doubtless delight the heart and mind of the modern neurologist, for he would probably find in it ample scope for the imagination to study and speculate upon somnambulism, hysteria, and paralysis: the causation and disappearance of these through the peculiar behaviour of the naughty neurons in forming illicit connections and disconnections without the knowledge or consent of their owner. Possibly this patient might have been cured by suggestion alone, but suggestion is much more effectual when accompanied by something tangible and sensible, whether it be massage and exercises for impaired motion,, or a good spanking for a naughty child, or feeding the starving heathen before christianising them.

The theory by which one part of the brain can take the place of another when diseased, has been formulated by Broadbent somewhat as follows:—Movements are represented in the opposite hemisphere in proportion as they are unilateral, in both hemispheres in proportion as they are bilateral, in execution. Either hemisphere can excite the bilateral movements, but only the opposite can excite the unilateral ones. Movements rather than muscles are represented in the hemispheres, and are lost in disease. Lateral movements by muscles of both sides are represented in both hemispheres, but in a normal state they are chiefly effected by the opposite hemispheres. When this is diseased, they are impaired until the hemisphere on the same side has acquired functional power over them, through mechanisms before existing but unused. We want more light on the manner and ways by which functional power may be acquired by means of mechanisms previously existing but unused in the brain. We know that a man can get along very well with one eye, one ear, or one testicle, and it would be rather remarkable if one side of such a vastly more important organ as the brain should not be capable of supplementing injury to the other, or doing the work of both. It would seem to be constructed with such an object in view, with its transverse, its association and longitudinal commissural fibres. It was a very wise man who said that we do not know how far one part of the brain may supplement another.

The most striking example of injury to the brain, with recovery, has never, to my knowledge, been thoroughly studied and analysed. It was that of the well-known case of the passage of a crowbar through the head, reported by Dr. Henry J. Bigelow.[1] While tamping a charge of powder, a spark caused an explosion, and drove a crowbar, weighing 13¼ lb., 3 ft. 7 in. long and 1¼ in. in diameter, through the skull of the patient. It traversed the cranium in a straight line from the left angle of the lower jaw below to the centre of the frontal bone above, near the sagittal suture, where it emerged. The patient quite recovered his faculties of body and mind, with only the loss of the sight of the left eye. A sort of anterior fontanelle or circular opening, of 3½ in. in diameter, was left behind by the removal of portions of the anterior-superior angle of each parietal bone, and of the frontal bone.

A NUTRITIVE DRINK FOR FEBRILE AND WASTING DISEASES.

By R. W. Leftwich, M.D., *London.*

THE range of choice open to a patient who has been placed upon liquid diet is so restricted, that I feel sure the profession will welcome any suggestion which will have the effect of safely extending it. At present the selection is practically limited to milk, meat-tea (prepared either from fresh meat or from proprietary extracts), Benger's food, whey, and barley-water. The last may be said to have no nutritive value; whey is useful in cases of obstinate vomiting, as also is Benger's food, which, however, is too sweet to quench thirst. "On beef-tea alone the invalid will starve" (Brunton), and there is further a grave suspicion that its extractives are sometimes toxæmic. The sheet-anchor is undoubtedly milk.

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[1] *Am. Journ. Med. Sc.*, Phila., 13th Sept. 1848.

The addition to the liquid dietary here proposed is not altogether new, for I sent a brief note upon it to one of the journals some ten or twelve years ago. The experience I have had of it since then has so impressed me with its value, that I am sure it deserves more than the very slight attention it received at that time. It may be described briefly as white of egg lemonade, and is at its best when made in the following way:—

Take—

Two lemons,
The white of two eggs,
One pint of boiling water,
Loaf-sugar to taste.

The lemons must be peeled twice, the yellow rind alone being utilised, while the white layer is rejected. Place the sliced lemon and the yellow peel in a quart jug with, say, two lumps of sugar; pour upon them the boiling water and stir occasionally. When cooled to about the ordinary temperature of tea, strain off the lemons. Now insert an egg whisk, and, when the lemonade is in full agitation, add slowly the white of egg. Continue the whisking for two or three minutes more. While still hot, strain through muslin. Serve when cold.

The white of egg will be found to impart a blandness which makes the addition of sugar almost unnecessary, and this absence of sweetness is greatly appreciated in pyrexial cases, and has its obvious value for diabetics. For non-febrile patients with clean tongues, more than the two eggs may be used to the pint, if desired, but the above is the best proportion in general. It may be objected that the drink is contra-indicated where albuminuria is present, and this may be true of Bright's disease; but I have not found that diphtheria or pneumonia cases exhibit either more or less tendency to this complication than others, and, after all, no one hesitates to order brandy-and-egg mixture for these diseases. Typhoid fever, again, is a disease in which the vast importance of careful dieting cannot be over-estimated, and any departure from routine methods requires grave consideration. I have never ordered beaten up eggs for this disease; for, in cases where I have seen them administered, they appeared to cause distension and, later, constipation. Still, many high authorities advise eggs—Ziemssen, *e.g.*, says three eggs a day. I believe, however, that it is the *yolk* of the egg that is responsible for the flatus and for most of the constipation engendered. The former condition at all events has never given me any trouble. Meat extracts, soup, etc., on the other hand, are often very badly borne, and may give rise to profuse diarrhœa. Milk, of course, is the grand essential, but how this palls upon the typhoid patients is known only to themselves and to their nurses, whose attendance is often one long fight to get the prescribed quantity taken. Moreover, the patient is frequently unable to assimilate sufficient to balance the terrible wastage of the fever; and thus starts his convalescence in an advanced stage of starvation. There can be little doubt that many of the complications of typhoid owe their successful onslaught to diminished resisting power due to this starved condition, while the connection is more direct between the atrophied skin and bedsores, and possibly also between the atrophied bowel and perforation. I venture to affirm, however, that a patient who takes plenty of this lemonade, in addition to four pints of milk per diem, will be found to emerge from the pyrexial period without that wasted, hollow-eyed, and skin-drawn look of the typhoid, and that, after a few days, instead of lying like a helpless log, he will be able to shift himself pretty freely.

The nutritive drink is of very great value in the febrile diseases of childhood. Young children have, in general, a strong dislike to beef-tea in any form. When insisted on, it usually has to be forced down, and the exhaustion following the struggle may more than balance its strength-giving properties; but they will drink any quantity of this nutrient lemonade, especially if the proportion of sugar is increased. On the other hand, I think the use of the beverage is contra-indicated in cases of gastric ulcer.

It is not necessary or desirable to let the patient know that the white of egg has been added. The "lemonade" may therefore be offered as a bribe to induce the patient to take milk in proper quantities. Another incidental advantage is, that the drink supplies those antiscorbutic properties which have been more or less destroyed by boiling or sterilising the milk. This is all the more valuable in camp typhoid, where tinned milk is frequently all that is obtainable, and sometimes, as in the present war, not even that.

Finally, especially in cases of typhoid, care must be taken that the eggs are new laid, and the lemons absolutely sound. At seasons of the year when good lemons are scarce, I have directed the drink to be made with citric acid and the essence. Bottled lemon juice is often a little musty.

CLINICAL RECORDS.

NOTES OF ABDOMINAL CASES ILLUSTRATING POINTS OF INTEREST.

By J. Crawford Renton, M.D., *Surgeon and Lecturer on Clinical Surgery, Western Infirmary, Glasgow.*

Case 1.—*Ligature of right external iliac artery for ilio-femoral aneurysm.*—A. C., æt. 58, was admitted to the Western Infirmary, suffering from a large ilio-femoral aneurysm which caused him considerable pain. In addition, there was evidence of heart disease, with a difference between the two radial pulses. On three occasions pressure over the abdominal aorta was tried for twenty minutes without producing any good effects. The external iliac artery was tied intra-abdominally, the aneurysm was completely free from pulsation for twelve days, and the limb was in all respects satisfactory. On the thirteenth day a slight amount of pulsation was noted; this gradually increased, but no pulsation has shown itself in the femoral artery, and two months elapsed before the posterior tibial could be felt. The patient is completely relieved of pain, and is so well that he declines for the present to have any other operation performed, and as the aneurysm seems very quiescent, it is hoped that the pulsation is due to a branch of the internal iliac joining with one from the external, above the site of the aneurysm. The ease with which the external iliac was ligatured was great, and the Trendelenburg position secured no trouble from the intestines.

Case 2.—*Enterotomy for impacted gall-stone.*—A. D., æt. 35, was placed under my care in the Western Infirmary by Professor Stockman, with a history of recurrent attacks of obstruction of the bowels, along with pain in the right iliac region. On examination, a hard swelling, the size of an orange, could be felt; it seemed movable, and occupied the position of the cæcum. Exploratory incision was recommended. On opening the abdomen, the hard mass was found to be movable to a slight extent in the cæcum; above the ileo-cæcal valve, it could not be pushed onwards in the bowel. The cause of this obstruction was not apparent at once. It was decided to open the bowel, and on doing so a large fæcal concretion was taken out; on passing the finger upwards, a gall-stone was found caught in a contracted ulceration; with some difficulty the gall-stone was removed, the ulcer divided and dilated, and the bowel closed. Patient made a good recovery, and has had no further trouble.

Case 3.—*Enterectomy for tumour in the sigmoid region.*—R. C., æt. 56, was sent to me by Dr. Syme of Kilmalcolm, suffering from recurrent attacks of obstruction. When the patient was placed under chloroform, a distinct tumour in the sigmoid region was felt, and, examining per rectum, it appeared to be sufficiently movable to justify operation. On opening the abdomen, the tumour was found and removed, O'Hara's forceps being used to effect end-to-end stitching.

The patient recovered without any bad symptoms, and has remained well.

Case 4.—*Excision of the cæcum and 4 in. of ascending colon for tumour.*—R. S., æt. 48, was sent to me by Dr. Moyes with symptoms of floating kidney on the right side. This was operated on in February 1901. In May the patient returned to tell me that the swelling had come back, but on examination the kidney was found to be in its place, and the cæcum to be affected with a hard tumour passing upwards along the line of the ascending colon. The abdomen was opened, and the cæcum with 4 in. of ascending colon removed, the ileum being joined to the colon over a Mayo-Robson's bobbin. The patient remains quite well.

Case 5.—*Case of tuberculous nodules in the stomach and mesentery.*—A. R., æt. 56, was placed under my care by Professor Stockman, suffering from tuberculous nodules in the stomach and mesentery, the symptoms being of four years' duration. One nodule specially gave acute pain on pressure. On opening the abdomen, this nodule was removed and one of those from the mesentery of the small intestine, the parts being carefully stitched thereafter; the other nodules were not interfered with. The abdomen was closed, and the patient has since remained perfectly free from pain and indigestion.

Case 6.—*Abscess in gall bladder.*—A. W., æt. 35, was sent to me by Dr. Berwick of Port Bannatyne, with a history that, after having suffered from dysentery, she was seized with severe attacks of right abdominal pain followed by jaundice, her temperature being 103° F. With such symptoms, our impression was that she was suffering from inflammation of the bile ducts and gall bladder, with probably an abscess and possibly gall-stones. An incision was made over the gall bladder, and a large abscess evacuated, but no stones could be found. The patient made a good recovery, and in all respects her condition is now satisfactory.

Case 7.—*Myoma of ovary causing obstruction of the bowels.*—A. L., æt. 72, was placed under my care by Dr. Sneddon of Cupar-Fife, with a history of recurrent attacks of obstruction of the bowels. On examination, a movable tumour was found in the pelvis; operation was advised, and the tumour, which proved to be a myoma of the left ovary, and which blocked the pelvis, causing obstructive symptoms, was removed. The patient recovered without any bad symptoms.

Case 8.—*Notes of a case in which abdominal section was twice performed in six months for obstructive symptoms; recovery.*—A. B., æt. 18, was sent to me by Dr. Strachan of Dollar, with recurrent attacks of obstruction of the bowels. On opening the abdomen, a band was found surrounding the colon, which was divided and removed. Five months later the patient began to suffer from intense pelvic pain and obstruction. Dr. Strachan detected a tumour in the pelvis, which was movable. On opening the abdomen, the right ovary was found to be cystic, with a long pedicle; this was removed, as also the left ovary, which was cystic. The patient is now entirely free from discomfort.

CASE 9.—*Tumour composed of cork-cuttings.*—A. K., æt. 27, was sent to me by Dr. White of Coatbridge, with the history that she complained of an abdominal swelling in the right iliac region, which had given rise to pain and vomiting and a temperature of 102°. The tumour, on examination, was extremely like an appendicical abscess, but was slightly more irregular in outline. On the evening of her arrival at the Infirmary I saw her, and as her temperature and pulse seemed to have improved, and the tenderness over the swelling was not so intense as in the morning, when Dr. White had seen her, I delayed operating until next day. Next morning her temperature was normal, and the swelling less tender. That afternoon she passed half a tumblerful of cork chips, which was followed later by another half-tumblerful. The tumour had entirely disappeared, and the patient appeared quite well. She had been in a cork factory for eighteen months, and had been in the habit of swallowing chips of cork.

REMARKS.—The above cases illustrate a few of the many abdominal conditions which require surgical interference. The usual technique has been carried out in all cases, with the exception that celluloid thread has been employed on several occasions. Internally, for ligature of ovarian pedicles and stitching the stomach or bowel, it has given satisfaction, but, used for deep stitching of the abdominal parietes, at the end of six weeks, when the patient begins to move about, in one or two cases it has given rise to irritation; and on that account chromic gut has been returned to as being an absorbable suture which gives no trouble. Through-and-through stitches of silkworm gut, with chromic suture of the aponeurosis, are very satisfactory.

REVIEWS OF
BRITISH AND FOREIGN LITERATURE.

Medical and Natural Science in the Nineteenth Century.

Geschichte der organischen Naturwissenschaften im Neunzehnten Jahrhundert. Medicin und deren Hilfswissenschaften, Zoologie und Botanik. By Dr. Franz Carl Müller. Berlin: Georg Bondi. 1902.

This volume forms part of a valuable series dealing with the history of the nineteenth century, and it deserves a warm welcome. We hope that it may help to keep alive the historical sense which the busy investigators of to-day seem in some danger of losing. It is a well-planned and carefully executed sketch of the progress of medicine and biology in the nineteenth century, and Dr. Müller has our hearty congratulations on the successful achievement of his difficult task. On the one hand, he has avoided platitudinarianism and extravagant eulogy; on the other hand, he has, by judicious restraint, kept his history from becoming an uninteresting catalogue of great scientific events. If we remember that even within seven hundred pages there is not space to do justice to every path of progress, we cannot fail to admire the effectiveness of this historical study. There have been many recent retrospects of nineteenth century science, but, considering the magnitude of the task—"Medicin und ihre Hilfswissenschaften"—we feel that this is the best one yet.

Before we describe the contents of this fascinating volume, we must pause to notice the portraits, which add not a little to its attractiveness. Though they are not all so good as Virchow's, which comes first, they are all successful, and include Jenner, E. du Bois-Reymond, Pasteur, Koch, von Pettenkofer, Lord Lister, von Bergmann, C. W. Hufeland, Gall, E. von Leyden, Semmelweis, von Gudden, Haeckel, and Julius von Sachs—quite a little gallery of genius.

After an introductory chapter on pioneers, such as Braid and Jenner, who were clearly ahead of their times, the author settles down to his task. The first place is given to anatomy and embryology, and we have a sketch of the progress from Bichat to von Kölliker, from Meckel to Gegenbaur, from von Baer to Roux, and so on. Once more the story of the cell theory is told, and much is made of the development of embryology, which was certainly characteristic of the century. Then follows a historical sketch of pathology, not so illuminative perhaps as one by Professor Greenfield, but full of interest. The central figure is Virchow, and the phagocytes receive a due share of attention.

Physiology comes next, with Johannes Müller as an inspirer, to whom the achievements of his scholars paid the highest compliment that has ever been rendered to a great scientific master. It need hardly be said that the chapter tells of the achievements of Claude Bernard, the brothers Weber, Helmholtz, du Bois-Reymond, Hoppe-Seyler, Pflüger, and all the rest; but it is perhaps more interesting to note the appreciation of some less familiar names.

Bacteriology has naturally a chapter to itself, in which Pasteur is the central figure; while Cohn, Lister, Roux, Metchnikoff, and how many more, including Behring and Kitasato, find due recognition. The chapter on hygiene is appropriately centred in Pettenkofer's life-work.

In the chapter on surgery the story of anæsthetics is told, and the exploits of the illustrious surgeons of the different nations are recorded in orderly sequence. Then follow chapters on the practice of medicine, gynæcology, nervous diseases, and jurisprudence.

The chapter on zoology leads us from Cuvier and von Baer to Huxley and Haeckel, with Darwin as the inspiring genius; and the chapter on botany recounts some of the changes which have occurred between the Jussieus and Pyrame de Candolle at the beginning, and Strassburger and Sachs at the end of the century. These two chapters, which occupy about one hundred pages, please us least, perhaps because we know more about the subject-matter; but we do well to remember again that the limitations of space necessarily involve some measure of sketchiness. If the reader searches the index for names which, he thinks, should have been mentioned, if he pounces upon the passage which treats of the subject in which he is most interested, he will probably meet with well-deserved disappointment. But that is not a fair way of dealing with a volume like this; it must be judged as an attempt to discuss, within narrow limits, the essential features of medical and biological progress in the nineteenth century. When so judged, Dr. Müller's volume will be found worthy of cordial admiration and of a place on the bookshelves of all interested in the historical development of the medical art or biological science which they profess.

J. ARTHUR THOMSON.

A Text-book of Pharmacology and some Allied Sciences (Therapeutics, Materia Medica, Pharmacy, Prescription-writing, Toxicology, etc.). By TORALD SOLLMANN, M.D., Assistant Professor of Pharmacology and Materia Medica, Western Reserve University, Cleveland, Ohio. Philadelphia and London: W. B. Saunders & Company.

THERAPEUTICS is a more important branch of human knowledge than Pharmacology; hence the expediency of enclosing the former word in brackets as a sub-title, or, according to Dr. Sollmann, as an "allied science," is a little doubtful in a work of this kind. The author gives his reasons, some of which are not very clearly expressed or easy to grasp. "To treat the subject apart from its practical application makes this application difficult. To treat it as an adjunct to clinical therapeutics deprives it of the logical arrangement which constitutes one of its chief advantages. The two, although interdependent, are best separated in the teaching. The former, the clinical application, belongs properly to the practice of physic." This is the point of view of one school of pharmacologists, but a much larger school regards pharmacology merely as an adjunct to therapeutics, and holds that it has no practical value for medical practitioners and no legitimate place in the medical curriculum of the schools, except what is derived from any bearing it may have on clinical therapeutics and the principles of treatment. As soon as pharmacological research goes outside this, it becomes merged in the great science of biology, and is as much apart from practical medicine as are physics, botany, zoology, or chemistry, which also touch it at certain points. If pharmacology ever comes to be taught to medical students apart from the therapeutical applications of medicines, it will lose its active interest and become largely a mere effort of memory, just as materia medica now is. This does not mean, however, that the pharmacological actions of substances which are not used as remedies have no interest and do not repay investigation, because such is not the case. On the contrary, such investigations, besides enabling us to classify drugs much more scientifically and broadly, have given us many new remedies and have greatly increased our knowledge of the older ones, so that pharmacology has become an established branch of medical science, but so far only as an auxiliary to therapeutics. Dr. Sollmann, however, has elected to write his book from a purely pharmacological standpoint, as affording what he himself calls a "logical arrangement," and has relegated therapeutics to a secondary place. The effects of this are seen in a great many of the articles, of which we may take the one on arsenic as an example. In this, seven and a half pages are devoted to what is practically a description of the poisonous action of arsenic, very little of which has any bearing on medical practice, while fifteen lines are given to the therapeutical applications which are mentioned, apparently for the express purpose of being "damned with faint praise." The same criticism is applicable to the articles on mercury, iodides, and numerous other drugs, the modes of action of which have hitherto baffled our still very crude and imperfect methods of pharmacological research. Another result of the author's method is that such therapeutical information as is given about individual drugs has to be sought for in different sections of the book. In most other respects Dr. Sollmann's work merits very high praise. The arrangement is in many ways new and original, while the contents show a very thorough and extensive acquaintance with recent pharmacological work and literature. There are six chapters on the anatomy and physiology of plants, materia medica, pharmacy, and prescription-writing, which serve as an introduction to the body of the work. A novel feature of the book is a series of practical exercises in chemical testing of drugs, in incompatibilities likely to occur in prescribing, and in pharmacological experiments on tissues and on animals, for all of which exact directions are given, so that they can be readily carried out by a teacher or advanced student.

RALPH STOCKMAN.

The Mental Functions of the Brain. By BERNARD HOLLANDER, M.D.
London: Grant Richards. 1901.

IN his preface the author informs us that his aim is to clear up "the mystery of the fundamental psychical functions and their localisation in the brain." Needless to say, the mystery remains, and the localisation of the "fundamental psychical functions" is as undetermined as ever. The evident, indeed the ostensible, aim of the book is an attempt to re-establish, upon the foundation of modern physiological and anatomical knowledge, the phrenological teachings of Gall and Spurzheim.

Although this recalls the process of putting new wine into old bottles, it would be unfair to the author not to admit that his arguments are plausible, that he has presented an extraordinary array of facts which go to support his thesis, that he manifests an erudition and an ingenuity which do him credit, and that if he has failed to prove his case, he has at any rate succeeded in reviving interest in a subject that was long ago believed to be dead.

From beginning to end the book is a piece of special pleading, marred occasionally by the author's expression of impatience with the stupidity or prejudice of those who disagree with him. Opinions are cited from the sayings and writings of innumerable authorities, most of whom would probably demur to the conclusions which the author somewhat enthusiastically claims. Opinions, as a rule, form but poor evidence, especially when, as in the present instance, they are culled in handfuls without sufficient contextual guidance as to the purpose for which they were given.

Nearly two hundred pages of the book are devoted to show, by means of the quotation of many hundreds of cases, the areas of the brain which, when injured or diseased, produce melancholia, furious mania, and delusions of persecution respectively. The conclusions drawn from these demonstrations are, that the emotion of fear is situated in the supramarginal and angular gyri; that irascibility has its seat in the middle part of the temporo-sphenoidal lobe; and that suspicion lies lurking in the postero-temporal region of the brain.

The author naïvely commences the argument founded on melancholia by premising that there are two forms of that disease, the one caused by a general brain anæmia, the other by his localised lesion. The reason for this is ludicrously obvious; but it is nevertheless useless, for there is no more ground for the one assumption than for the other. Melancholia is a well-marked constitutional affection, and, though many of the cases cited may be true forms of the disease, a careful perusal of them, as described in this book, is insufficient to convince an impartial reader that any one of them is a typical melancholia. Aberrant conduct, strangeness of disposition, suicide, even occasional mental distress, cannot be regarded as constituting melancholia. These cases and many of those grouped under mania are more easily recognised and classified as "traumatic insanities." Nothing is claimed except clinical distinction for the latter term; and although Dr. Hollander is doing good work in attempting to differentiate the lesions which underlie the various clinical forms of that indefinite group, his lesions are, unfortunately, not well defined. A blow on the parietal eminence, or on the side of the head, or the passing of a cart wheel over the head, gives no information as to the exact seat of a brain injury. If, as is asserted, symmetrical atrophy of the parietal lobule causes melancholia, it may, on the other hand, be submitted that that is no proof that the emotion of fear is situated there, for atrophy of any part of the brain may cause similar symptoms.

Much is made of middle ear disease being the cause of furious mania and delusional insanity, and although it must be admitted that middle ear disease has been seen in association with impulsive mania in rare instances, there is no causative relation between the two, nor has it been as yet demonstrated that there exists any disease of the temporal convolutions in these affections. The ready test of the author's assertions on the pathology of delusional insanity and furious mania—one that is open to Dr. Hollander in common with other workers—is to examine the nerve cells in the temporal convolutions in uncomplicated cases of the diseases. This is a simple and straightforward issue, which cannot be regarded as vexatious or captious. The argument on epilepsy is somewhat similar. It is stated that epilepsy is a basal disease, due to disease of the cornu ammonis or the adjacent inferior parts of the temporal convolutions. Here again the author is misled by half truths. Sclerosis of the cornu ammonis and localised atrophies on the inferior anterior parts of the temporal convolutions have been observed in some epileptic subjects; but we know, certainly, that in the great majority of idiopathic epilepsies there is no pathognomonic lesion of any kind. Besides the centres which are said to subserve emotions of various kinds, we are introduced to centres for kleptomania; for exaltation (situated in the posterior part of the frontal lobe, which, being affected in general paralysis, causes the "almost invariable optimism" met with in that disease); for the revivification of ideas, and for veneration. The latter centre is the material substratum of "religious insanity." Assuming, for a moment, the existence of these quasi-independent centres, a serious flaw in the author's argument may be stated as follows:—We know that injuries or diseases of certain well-defined sensori-motor centres cause loss of function, but the line of argument here pursued seems to point to the fact that lesions tend to exaggerate function, even when, as is here often indicated, the cortical substance is more or less destroyed. The argument founded upon mental diseases occupies such a prominent position in the book, and is so evidently original, that the thesis must practically stand or fall by it. Dr. Hollander's acquaintance with insanity is, though extensive, apparently literary and theoretical, and his want of practical knowledge has allowed him to fall repeatedly into error. In ordinary circumstances, mistakes of this kind are excusable, but when they are made the basis of hypothetical superstructures it becomes necessary to expose them.

The remaining part of the book is interesting, and in many ways instructive, but occasionally we meet with such startling quotations as that 73 per cent. of female skulls are dolicocephalic (p. 300), and that broad headedness is a sign of selfishness (p. 350). It would be a bold deduction to assume that the dolicocephalic races of mankind are less selfish than the brachycephalic.

A survey of the author's general position and of the result of his labours conveys the impression that, while availing himself of the latest and best acquirements of neurology and anthropology, he has violently dissociated himself from the lines upon which these sciences must and will continue to advance. The result can only be ineffectual, for whatever truth there may be in his conceptions can only be substantiated by aid of these sciences, slow and painful though their growth may be. A plea for homœopathy, as ably written as Dr.

Hollander's for phrenology, might contain many indisputable truths and as many assertions incapable of refutation; but while we should continue with advantage to use some drugs in homœopathic quantities, we would still reject the more extreme principles of the system. So it is with phrenology, which, within an agglomeration of speculative crudities, contains a considerable amount of practical fact.

JOHN MACPHERSON.

Die Parasiten im Krebs und Sarkom des Menschen (*Parasites in Cancer and Sarcoma of Man*). Von Professor Dr. MAX SCHUELLER, Berlin. Jena: Gustav Fischer. 1901.

PROFESSOR SCHUELLER has written an elaborate account of an organism or organisms discovered by him in cancers and sarcomas. He first describes his culture methods and the variations therein, and the appearances, living and dead, of the parasites, with their colour reactions, conditions of life and growth, and other particulars. He contrasts the culture appearances of the parasite of sarcoma with those of cancer, and shows that, although very similar, there are minor differences which enable the observer to distinguish the one from the other. The second part of his book describes the parasites in living and dead connective tissue and in glands, the reaction of the tissue to their presence, and how they become shut up in cells and cell-nests. The paths of invasion of the parasite, its pigment and staining properties, free and in sections, are duly described. The results of inoculations of animals, and the biological position of the parasite, are discussed. He lastly deals with the prevention of its entrance into the body, and the means of combating it after it has entered. The book is most interesting; and if its author's observations be corroborated, there can be no doubt that his parasite satisfies Koch's postulates. The careful student will, however, have some difficulty in accepting his arguments as they stand. The movements ascribed to the young parasites are so slight that they can hardly be taken as sufficient evidence of life. Again, the author states that his parasites are easy of demonstration: that by examining a piece of living or dead tissue in a few drops of lavender oil they may be seen, in great numbers, as relatively large golden-brown globules, with a finely granular protoplasm invested by a capsule, which occasionally falls off, leaving an empty network. Now, if they are so easy of detection, why have they remained undiscovered so long? The suggestion that Schueller has been deceived by artifacts is difficult to shake off; but if so, how are the inoculation experiments to be accounted for? He claims that his parasites produce similar growths in animals to those in which they are found in man. The book is certain to stimulate investigation, and it may thus bring about good results, even if its own conclusions should prove to be untrustworthy. R. F. C. LEITH.

Maladies du cuir chevelu. 1. *Les Maladies Séborrhéiques: Seborrhée, Acnés, Calvitie.* Par le Dr. R. SABOURAUD, Chef du laboratoire de la Ville de Paris a l'hôpital Saint-Louis. Paris: Masson et Cie. 1902.

THE projected dissertation, of which this is but the first instalment, is one calculated to tax even its author's well-known energy and resource. In a series of five octavo volumes he proposes to treat of the disorders of the scalp, with a fulness of pathological detail never attempted before. The heading of the preface "setting forth what matters will be discussed in this treatise, and in what order these will be presented," irresistibly reminds one of the preamble of a chapter of "Gil Blas," and it must be conceded that the subject matter has a tinge of romance about it; yet, in perusing the work, one always seems to be pursuing a *fata morgana* through its pages, which as constantly eludes one's grasp. There is a something intangible, unrevealed, which ought to be there but is not. One wonders how the contents would appear to Dr. Sangrado, could that worthy return to earth, and dip into them during the intervals of a search in the second-hand shops of Valladolid for a lancet.

It is satisfactory to find that, in Sabouraud's opinion, the term seborrhœa is no misnomer, but that it really means an excess of fluid secretion from the sebaceous gland, and is not simply an oily hyperhidrosis, as Unna at one time insisted on, though not infrequently perspiration is redundant also. The primary and characteristic lesion of seborrhœa is a fatty cylinder contained in every pilary orifice, from which it can be dislodged by pressure. The comedo is this same fatty cylinder sheathed in an envelope of epidermic débris, occupying and distending the upper part of the follicular outlet. This latter development is, however, exceptional, and remains in the vestibulum, while the soft filament is being continually if only partially extruded. Both contain in their substance multitudes of a special micro-bacillus, cultivable with some difficulty, but so far not inoculable on animals. The seborrhœic process starts from the central line of the face or trunk, spreading outwards by consecutive infection of follicle after follicle. The situations succeeding in relative frequency that of the face, which he states is more often affected in young females than in males, are the interscapular and the inter-mammary; in the latter, from coincident excess of sweat, the surface is always moist, hypersteatidrosis. Such a seborrhœic skin is peculiarly vulnerable, so that a number of exfoliative maladies attack it, though, apart from its establishment, it would remain immune from these, the various forms of seborrhœic dermatitis. These, dry or greasy in character, are ascribable to the bacillary spores of Malassez.

In much the same way acne may complicate seborrhœa, the word being taken to indicate accidental transformations, degenerations, and secondary infective lesions of the seborrhœic cocoon or comedo. The transformation of the soft seborrhœic filament into the comedo suspends or partially dries up the fatty secretion. Thus, a face studded with comedones is always less oily than the same countenance was before acne proper supervened. When the comedo proceeds to suppuration, there is found, at and around its summit, either the bacillary spores already mentioned, or more commonly colonies of staphylococci. Situation in the follicles and differences in virulence account, according to our author, for the occurrence of a pustular, a keloidal, or a necrotic acne in individual instances. This explanation cannot, we think, be regarded as sufficient.

More than one-half of the volume is devoted to baldness, that currently associated with seborrhœa being almost solely considered.

This he admits is five to ten times as frequent in the townsman as in the genuine inhabitant of the country. One by one various reputed causes are discussed—city life (which he compares to that of the stall-fed cattle), mental toil, too free use of animal food, alcoholism, sexual excesses, neurasthenia. A coin bearing the head of Hippocrates of Cos shows unmistakably that the father of medicine was as typically bald as any of its modern sons. This form of alopecia he regards as a disease of males; when females lose their hair permanently, their baldness is a pellicular one, and corresponds to the alopecia pityrodes of Pincus and Unna, to be studied in a forthcoming volume. There is an idea briefly alluded to, which has also occurred to myself, that baldness may be due to the perversion, or to the arrest of the secretion of one of the internal or ductless glands. There is a singular relation, he observes, between sexual activity in the male and alopecia of the crown. "The internal secretion of the sexual glands of the male may determine the indispensable conditions which lead to baldness." This is a line on which investigation might be pursued with profit. Inquiry into the urology indicates that hypophosphaturia is a fairly constant phenomenon, pointing to impairment of nutrition.

Sabouraud traces the gradual advance of baldness from the vertex or forehead to the sides, which he submits corresponds to the progress of seborrhœa, yet he has to own that there are cases where seborrhœa is particularly marked, while no baldness ensues. This in our experience is the case in women, who have, far more frequently than men, excessively greasy locks. With reference to this point, he asserts that those few females whom he has encountered with typical seborrhœic baldness were masculine in features and character, were "defective men." Sabouraud's theory does not explain why all the scalp hair in men is not destroyed, why even a fringe remains. Nor is there evidence that control experiments on healthy persons were carried out, to show how far his bacillus is pathogenic. Micro-organisms have their rôle in health as in disease. Where is the line to be drawn between a healthy unctuousness of the integument and an unhealthy oiliness? What is normal in the dark races is abnormal in the white as respects this. It is not so long since the *Demodex folliculorum*, now regarded as a harmless occupant of the pilo-sebaceous canal in man, was gravely looked on as the cause of acne. Who can tell whether, in the course of a few years, the bacillus of Sabouraud may not be considered a tenant of the orifice of the same canal, possibly at most exerting a regulating action on the quality of the secretion? Perhaps when his entire scheme is before us things may assume an altered aspect. With the evidence at present adduced, we are not convinced.

Fully sixty pages are devoted to treatment, which is entered into in much detail, but a statement with which it opens is discouraging: "We can ameliorate seborrhœa, we cannot cure it." Still, as this is our position with respect to more grave maladies, we must be content, all the more as certainly a great deal can be done. One cannot close this notice without expressing our admiration for the very beautiful illustrations so abundantly provided, and which render every affirmation clear and comprehensible. The pale lemon-coloured cover, with the representation in colour of a diseased hair follicle, is quite "fetching."

W. ALLAN JAMIESON.

RECENT ADVANCES IN MEDICAL SCIENCE.

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MEDICINE.

UNDER THE CHARGE OF

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THE PECULIAR ODOUR ATTACHING TO EXPIRED AIR IN EARLY PHTHISIS PULMONUM.

ROSENBACH (*München. med. Wchnschr.*, January 28, 1902), who, as far back as 1893, first called attention to this symptom, returns again to the subject. He suggested, and suggests, that the air expired by some of the victims of phthisis, or even some of those predisposed to the disease, especially when young, has a peculiar pathognomonic odour, and that this symptom or sign possesses true clinical value. Flat, sweetish, and repulsive, slightly reminiscent of putrid bronchitis, the odour does not seem to come from the sputum, for it can be recognised in cases where the sputum is almost nil, but appears to be connected with the exhaled air itself. From personal observation, he is inclined to regard prognosis of every case exhibiting the symptom as unfavourable, even if apparently full of good promise at that time. It is somewhat surprising that this specific odour of the breath varies inversely with the degree of actual destruction of lung tissue by the varied agents at work in causing phthisis, and inversely also with the quantity of sputum elaborated. Affections of the mouth, pharynx, teeth, tonsils, nose, or stomach, to which severally *fœtor ex ore* is commonly traceable, have no, or at most an infinitesimal, part in production of the odour. As the odour can only be the outcome of bacterial activity, at expense of the tissues, if there should be any doubt as to its real source, owing to coincident affections of organs just mentioned, the rational employment of antiseptic remedies thereupon can readily settle the question; for if the odour comes from the lung, it will not be affected thereby; if from parts directly amenable to treatment, be dispelled or modified. Rosenbach in this connection states, judging from his experience, that individuals whose teeth are sound and strong are especially insusceptible to phthisis pulmonum.

The conclusion drawn from the facts of the paper is to the effect that tuberculous disease in the body is dependent upon heredity, and individuality, disposition, and constitution, more than upon actual infection. The bacillus of tubercle is not the foe to be fought; rather individualistic inability to prevent, or leaning toward, the offensive occupation of the tissues by pathogenic microbial foes, not necessarily belonging to any one particular species, only productive of special lesions.

REFLEXES AND LOCAL NERVE REACTIONS.

1. *The scapulo-humeral reflex of von Bechterew.*—Pickett (*Journ. Nerv. and Mental Dis.*, N. Y., May, 1901) investigated von Bechterew's scapulo-humeral reflex in 122 cases of organic nervous disease. Hemiplegia formed seventy-one of the total, locomotor ataxia nine, etc. He concluded from his study of these cases that reflex response was of some clinical value, while absence of any reaction could hardly be founded upon for diagnostic purposes. The muscles which reacted were, in descending order of frequency, the deltoid, biceps, rotators of the forearm, of the upper arm, the pectorals. Further, he came to the conclusion that, as with the knee-jerk, the scapulo-humeral reflex is increased when lesions of the central segments of the motor system are present, diminished in spinal and peripheral nervous disorders. On the other hand, the reaction is too complex and vague, the parts responding too variable, to offer any very great aid to clinicians.

2. *The tendo Achillis reflex.*—Strassburger (*Deutschė Ztschr. f. Nervenh.*, Leipzig, Bd. xvii. S. 3 u. 4) found the tendo Achillis reflex to be absent in very few normal individuals. It must be borne in mind that the phenomenon is often difficult to elicit. In tabes it frequently disappears, along with the failure of the knee-jerk; but the Achillis reflex may be lost before the patellar, or *vice versâ*. In ischias a normal Achillis reflex is often obtainable; nor does its character appear to be a help in making a prognosis.

3. *The biceps tendon reflex in locomotor ataxia.*—Behrend (*Phila. Med. Journ.*, June 1, 1901, quoted in *Treatment*, December, 1901), from a study of the above subject of some years' duration, concludes—(1) that when the biceps jerk is absent the ataxia in the arms is usually more marked; (2) when ataxia in the legs is marked, it is, as a rule, considerable in the arms, and the biceps jerk is absent; (3) presence of the biceps reflex, with but slight ataxic symptoms in the arm, invariably is associated with pronounced ataxia in the legs; (4) normal biceps jerk generally predicates normal sensation; (5) *per contra;* (6) arthropathies are found only in advanced cases; (7) astereognosis only in markedly ataxic cases; (8) loss of sense of position almost constant in the same; (9) shooting pains in the arms do not correspond with the degree of ataxia; (10) loss of weight sense seldom accompanies pronounced ataxic conditions; and (11) that on the extent of the spinal lesion, not the duration of the disease, depends the intensity of the symptoms displayed.

Fränkel (*Deutsche Ztschr. f. Nervenh.*, Leipzig, Bd. xvii. Hefte 3 u. 4) has come to the conclusion, from personal observations, that failure of the tendon reflexes in the upper arm is a constant symptom in locomotor ataxia, a symptom appearing at a very early stage of the disease, and one which is more constant than Westphal's sign. In tabetic cases mechanical irritability of the muscles is usually heightened, a symptom of special importance where the tendon reflexes are wanting.

THE WESTPHAL-PILTZ REACTION.

NAMED after the two German physicians who published almost simultaneously papers on the subject in 1899, although Galassi in Italy in 1877, and Gifford in England (or perhaps America) in 1895, had previously noted it, the Westphal-Piltz reaction consists of a contraction of the pupil with rotation of the eyeball upwards and outwards, when the orbicularis muscle is forcibly contracted, while the eyelids are prevented from shutting. The phenomenon only occurs in cases in which the reflexes of the pupil are wanting, the pupil itself dilated, or the reaction to light lost, that for distance retained. Schanz regards the phenomenon as being the result simply of pressure on, and consequent engorgement of, the vessels of the iris;.Westphal originally ascribed it to associated action on the part of the apparently paralysed pupillary branch of the oculo-motor nerve and the sphincter of the iris, similar to that which normally occurs when vigorous attempts to close the eyelids were made, but prevented. Westphal still remains of this opinion. It has been shown, however, that simple pressure on the eyeball sometimes causes similar movements. Schanz observed the reaction in cases after introduction of atropine and of cocaine. This positive result after cocaine he uses to support his view; Westphal conversely.

Schanz concludes by stating his opinion that all explanations of the reaction based upon associated movements seem to be wrong; Westphal, that the theory of associated movements, to his mind, is the most probable explanation of the phenomenon.—Schanz, *Berl. klin. Wchnschr.*, 1901, No. 42; Westphal, *ibid.*, No. 49.

THE TIBIALIS PHENOMENON IN SPASTIC PARESIS.

STRUMPELL (*Deutsche Ztschr. f. Nervenh.*, Leipzig, 1901, Bd. xx. S. 436, cited *Schmidt's Jahrb.*, Leipzig, 1902, Heft 2, S. 168) fourteen years ago drew attention to this phenomenon, and returns to it. "The tibialis phenomenon is essentially a characteristic of spastic paresis, and is throughout analogous with the increased tendon reflexes, heightened muscular tone, the toe reflex of Babinski, etc. In all muscular paralyses, on the other hand, with lowered muscle tone, loss of tendon reflexes, etc., it is absent."

The phenomenon itself is shown when the patient, lying down, draws his leg up towards the trunk (bending the hip- and knee-joints), for then the inner edge of the foot is drawn up, owing to unopposed action of the tibialis anticus muscle. The cause seems to be loss of power to separately innervate the ilio-psoas muscle, because of an affection of the pyramidal tracts of the cord.

Strumpell does not regard the pyramidal tract as the sole repository of the motor fibres. Primary degeneration of this tract does not cause a true paralysis of, but great hypertonicity in, the muscles. So the pyramidal fibres seem to be more concerned with the task of regulating, inhibiting, and co-ordinating that of simple movement. In new-born infants both the tibialis phenomenon and Babinski's toe reflex are normally present. In addition to the tibialis reaction, Strumpell enumerates three further similar phenomena associated with lesions of the pyramidal tract:—(1) *Dorsiflexion of the great toe*, on stretching out the leg, especially on raising the extended leg, from whatever it is resting on. (2) *The radialis phenomenon*, where in the instinctive dorsi flexion of the hand associated with clenching, as a fist, cannot be prevented, as is possible in health. (3) *The pronation phenomenon*, wherein the arm, hanging supinated by the side of the body, cannot be brought forward and upward still in the same degree of supination, as normally can be done, but displays a certain amount of forearm pronation as the upper arm is raised; this is hemiparetics. The diagnostic value of these phenomena concerns the separation of functional from organic paralysis.

SURGERY.

UNDER THE CHARGE OF

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MORBID ANATOMY OF THE BLADDER IN CHRONIC CYSTITIS (NON-TUBERCULOUS).

HALLÉ and Motz have examined histologically 100 bladders from patients who have died of chronic inflammatory affections of the urinary organs, non-tuberculous in nature. The results of this exhaustive investigation are described in detail, and copiously illustrated in the monograph before us. The cases fall into three groups:—(1) pure chronic cystitis without obstruction to the flow of urine; (2) chronic cystitis associated with stricture of the urethra; and (3) chronic cystitis associated with hypertrophy of the prostate.

1. The first group contains twelve specimens, and in all it is found that the bladder is small and retracted, its walls thickened and indurated, and more or less undilatable. In the more advanced cases all the coats of the bladder are implicated. The mucous membrane shows desquamation of the epithelium, dilatation of the blood vessels, and small-celled infiltration of its substance. The submucous tissue is thickened and sclerosed, and fixes the mucous membrane to the muscular coat. Hypertrophy of all three layers of the muscular coat is constant, and the muscular fasciculi are often bound together by dense fibrous tissue. The fibroserous coat of the bladder usually shares in this general sclerotic process. The term "complete chronic interstitial cystitis" indicates the general nature of the pathological changes in the structure of the bladder. The inflammatory process starts in the mucous membrane, and successively invades, by way of the vascular connective tissue, the other coats. The muscular hypertrophy is the result of the strong and frequent contractions rendered necessary by the irritability of the mucosa. The sclerotic lesions are secondary, and result from the chronic inflammation of the hypertrophied fasciculi.

2. Twenty-six cases of chronic cystitis associated with *stricture* of

the urethra were investigated. The obstruction to the flow of urine, together with the chronic inflammation, are attended with lesions very similar to those of pure chronic cystitis. The thickening of the bladder wall reaches its maximum in this group, and the distensibility of the bladder is so slight that the cavity tends to have a fixed capacity. The muscular coat is hypertrophied before the cystitis develops, and all three muscular layers are found regularly and equally affected to a marked degree. Sclerotic and degenerative changes are frequently met with in the greatly thickened walls in cases of stricture.

3. In *prostatics* the lesions are more complex and less easily explained. The chronic inflammatory process, together with the increased resistance to be overcome by the bladder, does not explain everything. The senile retrogressive changes in the tissues play an important rôle in the production of the lesions. The bladder is enlarged and distended to a greater or less extent. The muscular hypertrophy is always most marked in the internal layer, and is often confined to it. Hence the development of the muscular columns, which are so characteristic of the bladder of prostatics. In recent and moderately severe cases of cystitis, the middle and outer muscular layers are not hypertrophied, and may even be atrophied and infiltrated with soft fibrous tissue. This explains the muscular atony or insufficiency so often met with in prostatics. When the cystitis is severe and long-continued, the wall may be thickened and sclerosed as in other forms of chronic cystitis, the only important difference being in the rugous condition of the internal muscular layer which characterises the bladder in cases of enlarged prostate.

The authors do not believe that the atrophy of the middle and outer muscular layers is primary. They believe that it is preceded by a temporary hypertrophy, the result of the obstruction to the outflow of urine offered by the enlarged prostate. The insufficient nutrition of the tissues resulting from arterio-sclerosis associated with old age, leads to secondary atrophy and dilatation.—*Ann. d. mal. d. org. génito-urin.*, Paris, January and February, 1902.

LIGATURE OF THE ABDOMINAL AORTA FOR ANEURYSM.

ROBERT P. MORRIS records a new case of ligature of the abdominal aorta. The operation was performed for dissecting aneurysm involving the wall of the aorta from the cœliac axis to the mesenteric vessels. This makes the fourteenth recorded operation in which the aorta has been ligatured. So far they have all proved fatal, but this case is encouraging, as showing that there is no inherent reason why success should not yet be attained. The patient, a coloured woman, æt. 24, suffered from a pulsating tumour in the epigastrium, which was associated with constant pain and severe vomiting. There was no history of syphilis, but there seems little doubt that the patient was syphilitic. Morris' idea was to employ temporary ligature of the aorta in order to allow the sac to fill with clots, and then to remove the ligature and allow the circulation in the extremities to continue as before. An incision was made from the ensiform cartilage to the umbilicus. A soft rubber catheter was passed round the aorta between the aneurysm and the bifurcation, and pulled sufficiently tight to arrest pulsation in the femoral arteries. The catheter was fixed with clamp forceps, to obviate the necessity of tying a knot. The wound was sutured, room being left for the ends of the catheter and the forceps to project on the surface. Nine hours after the operation the patient's legs became warm for the first time. There was intense pain and a feeling of numbness in the legs. The urine and fæces were passed involuntarily. Nineteen hours after operation the patient could feel the prick of a pin over the thigh, but the legs showed general loss of sensation. In twenty-two hours the heaving expansile pulsation began to diminish, and an hour later the tumour appeared to have diminished to about half its previous size, and it continued to diminish. Twenty-seven hours after operation the ligature was removed by uncoupling the forceps and withdrawing the catheter. The femorals began to pulsate again, sensation was restored in the legs, and the control of the sphincters was regained. For two days the patient did very well, but on the third day she showed signs of intense septicæmia, and she died fifty-three hours after operation. On post-mortem examination, it was found that the septicæmia was due to gangrene of small portions of the bowel, which had lain in contact with the forceps used to clamp the ligature. The aneurysm was found to be full of blood clot, while the aorta remained patent. An embolus was found in the left internal iliac. The case demonstrates that an aneurysm of the aorta can be made to fill with clots, by the application of a temporary ligature to the aorta, and that circulation in the extremities may be re-established on removal of the ligature. Abstracts of all the cases of this operation hitherto published are appended to this paper.—*Ann. Surg.*, Philadelphia, February, 1900.

A CASE OF LINGUAL THYROID.

TEWELES records a case of "goitre" of the root of the tongue. The patient, a girl of 9, suffered from general debility, nasal speech, and nocturnal snoring. There was a marked bulging in the hyoid region, but the thyroid gland itself appeared to be of normal size. On digital examination of the root of the tongue, a bullet-like, sharply defined tumour was felt. It was elastic, with a smooth upper surface, and was not painful on pressure. It projected into the pharynx, with a broad base at the root of the tongue pressing the epiglottis somewhat downwards. The laryngoscope showed a pale red, vascular, sharply limited tumour. A loud bruit was audible over the great vessels of the neck. The heart and lungs were normal. At the operation the tongue was pulled strongly forward till the tumour was plainly visible, and lay immediately behind the teeth. The vessels were thus compressed and the whole field of operation easily commanded. The necessity for a preliminary tracheotomy was thus obviated. The tumour was enucleated after division of the mucous membrane over it, and the patient made a good recovery. The diagnosis was confirmed by microscopic examination.—*Wien. klin. Wchnschr.*, 1902, No. 8.

THIOSINAMIN IN THE TREATMENT OF NON-MALIGNANT STRICTURE OF THE ŒSOPHAGUS.

TELEKY, in a paper on the "Mechanical and Medicinal Treatment of Stricture of the Œsophagus due to Scar Tissue," reports several cases where the administration of thiosinamin was followed by softening and yielding of scar tissue. In two cases of old-standing stricture, due to swallowing caustic potash, which resisted the passage of bougies beyond No. 17, after prolonged treatment, the administration of thiosinamin caused softening and yielding of the constricting tissue, sufficient to admit bougies up to Nos. 21 and 22. Teleky advocates the employment of this drug only in cases of at least six months' duration, as very recent scars may give way altogether under its influence. He instances a case where he administered thiosinamin twelve days after doing gastrostomy for œsophageal stricture. Up till that time the fistula worked perfectly, and the stomach retained its contents, but after the first injection of thiosinamin the adhesions gave way with disastrous results. In cases of malignant disease its use is not advisable, owing to its lymphagogue action, which might lead to metastasis. Similarly, in patients who have healing tuberculous lesions in the lungs or elsewhere, it is contra-indicated, as cases have been recorded where inflammatory processes have been aggravated under its influence. Its employment is only indicated where it is desired to soften and stretch old-standing scars—*e.g.* in simple stricture of the œsophagus, adhesions round joints, stricture of the urethra, etc.; any active inflammatory process is aggravated by its use. Teleky employs a 15 per cent. alcoholic solution for hypodermic injection, injecting from 3 to 10 minims every second or third day.—*Wien. klin. Wchnschr.*, 1902, No. 8.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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THE CHOICE OF OPERATIONS FOR UTERINE MYOMATA.

OLSHAUSEN (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 1) refers to the importance of retaining one or both ovaries in operating for myomata, as the sudden and artificial menopause set up by their removal causes far more trouble than when occurring naturally. Zweifel even thinks that removal of a myomatous uterus reacts on the ovaries, causing their atrophy in a year or two, with troublesome symptoms as the result. He therefore recommends that a piece of the uterine body with its mucous membrane should be retained, to permit of the continuation of menstruation, the operation being of the nature of a resection rather than a supravaginal amputation. Werth likewise points out the importance of leaving at least one ovary, and states how seldom troublesome symptoms come on after vaginal hysterectomy, where the ovaries are left. As early as the first week, in cases where the ovaries are removed, signs of congestion and copious sweating may occur, independent of a menstrual period, showing that it is not the absence of menstruation, but of the internal secretion of the extirpated glands, that causes those symptoms. Psychosis may also follow the complete extirpation, and Olshausen describes three cases where the patients were sent to an asylum within three weeks of the operation. He always endeavours to leave one ovary.

Of forty-eight cases of supravaginal amputation, both ovaries were left in seven cases, one in thirty cases, and both were removed in eleven; but of those, ten were between 46 and 54. He points out, however, the possibility of cystic disease occurring later in the ovary left behind, and describes four cases where this happened. The interference with the circulation through the ovary, as the result of the ligatures, may start degenerative changes and follicular hæmatomata. To avoid such changes, Olshausen protects, as far as possible, the tissues in the neighbourhood of the hilum especially. In order to save as much uterine tissue as possible, he strongly recommends enucleation, which he does in about 27 per cent. of the cases requiring operation. In young patients especially is it indicated. Thus, of thirty-five cases, three were under 30; twelve were about 30; sixteen were about 45; and four over 45. In those cases there is the chance of recurrence, and Olshausen has had to repeat the enucleation in more than one case, and he has removed as many as nine myomata at one time. He points out the difficulty of choosing between enucleation and supravaginal amputation. If the tumour gives the appearance of a pregnant uterus, without any projection on its anterior or posterior wall, amputation is alone possible. If the sound does not pass beyond 10 to 11 cms., enucleation is possible; but if the uterine cavity is longer, amputation is the better operation. In the technique of enucleation, arrest of hæmorrhage is the important part—achieved by ligaturing bleeding points, and closing the bed of the tumour with interrupted or continuous catgut sutures. Abdominal enucleation will, he thinks, in time greatly displace vaginal extirpation and enucleation. Enucleation by anterior or posterior colpotomy is only applicable to cases where there are not more than one or two subserous tumours, and, as a rule, such do not give rise to symptoms demanding operative interference. Vaginal extirpation should be limited to cases where the uterus does not exceed in size a three months' pregnant uterus.

TWO CASES OF LAPAROTOMY FOR SPONTANEOUS RUPTURE OF THE UTERUS DURING LABOUR.

TÖRNGREN (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 1) reports two cases—One case complicated with tear of the bladder; sutured; no drainage; death.

Case 1.—P., æt. 41, 6-para; three normal labours, one abortion; two forceps deliveries. Pains began on September 28; in the evening membranes ruptured. At 5 A.M. on 29th she complained of sudden illness; the pains ceased. On examination, the head was movable above the brim, abdomen distended and tender, heart sounds inaudible, true conjugate 8·8 cms. On passing the catheter, the point protruded through the vagina. Delivery by cephalotripsy. There was found an oblique tear running across the anterior uterine wall, and from this another tear ran obliquely into the vesico-vaginal wall. The mucous surfaces of the tear were sewn up per vaginam. On opening the abdomen, there was found a gangrenous area the size of a hazel-nut on both sides of the tear. This was cut away with scissors, and bladder wall, uterine muscle, and peritoneal coats sewn with catgut. Death from sepsis on second day.

Case 2.—P., æt. 43, twelve children; all labours normal, except the last, where the child was dead, and forceps were used. On admission to hospital, the abdomen was found pendulous, pelvis normal, cranial presentation, membranes unruptured. On the second day the membranes ruptured, and the head could not be felt through the vagina, but later the posterior parietal bone engaged at the brim. No advance being made, turning was performed, and, when pulling down a foot, a rupture was discovered on the anterior wall of the lower uterine segment, through which the child's head projected. Laparotomy showed a complete rupture 10 cms. long, successfully treated by supravaginal amputation.

The first case represents treatment which would not now be accepted as permissible. The rupture in the second case Törngren supposes due to degenerative changes in the elastic fibres of the uterus, although the evidence given for this is not very satisfactory. He refers to the treatment of such a case by packing with iodoform gauze, but does not appear to favour it in hospital practice.

HYDATID MOLE ASSOCIATED WITH DOUBLE OVARIAN CYSTOMA.

Baumgart (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 4) points out how we are still in the dark regarding the etiology of hydatid mole, although such conditions as debility, anæmia, cardiac disease, chronic kidney disease, and syphilis have all been cited as causes. Kaltenbach observed this condition unusually frequent at the beginning and end of the child-bearing period, and Kehrer also noted its frequency in elderly women. Other authorities think the condition is due to primary changes in the ovule, especially in that part of it corresponding to its point of attachment to the uterine wall. Virchin believed that the cause might lie in some irritation derived from the inner surface of the uterus or direct from the mother's blood. Schröder found the condition frequent in cases of interstitial myoma. Schoorel, regarding hyperplasia of the connective tissue with œdema as the essential change in hydatid mole, attributed the hyperplasia to alterations in the endometrium, giving rise to circulatory changes. The idea that primary changes in the ovaries might also cause the condition, has its supporters, and Baumgart reports the following case:—P., æt. 22, expelled a mole after two months' amenorrhœa, and on examination there was found a bilateral cystic movable tumour, each the size of a child's head. The uterus was curetted and the endometrium found in a condition of interstitial inflammation, the epithelium being fairly intact, degenerating cells appearing only here and there. The cysts were removed without difficulty. Such cases are rare. Ruge has reported a case of myxomatous degeneration of the placenta terminating fatally, and associated with ovarian cysts. In all the reported cases the ovarian disease was bilateral. Baumgart believes that circulatory changes set up in the endometrium, consequent on the presence of ovarian cysts, may be of etiological importance in causing the condition of hydatid mole.

DIAGNOSIS OF HYDATID MOLE.

POTIN (*Monatschr. f. Geburtsh. u. Gynæk.*, Berlin, Bd. xiv. Heft 3) calls attention to the fact that when a hydatid mole is present in the uterus, there are usually contractions of individual, and generally large sections of the muscular, tissue of the organ. In one case recorded by him, the tumour thus produced was as large as the closed fist, and at first was considered to be a fibroid tumour. This type of contraction is not met with in normal pregnancy, and, according to Potin, is characteristic of hydatid mole. He believes that the cause lies in the fact that local detachments of the hydatid masses occur, resulting in reaction of the uterine walls over those areas.

CHORIO-EPITHELIOMA OF THE VAGINA.

SCHMIT (*Wien. klin. Wchnschr.*, 1901, No. 44) describes the following case:—Patient, æt. 41, seven weeks after a second abortion, suffered from hæmorrhage, the cause of which was found to lie in a bluish tumour, about the size of a walnut, situated in the anterior vaginal wall. On microscopic examination, this growth proved to be a hæmatoma, which contained in its centre, chorionic villi and other elements of the so-called deciduoma malignum, which were undoubtedly derived from the superficial layers of the villi. Schmit supposes that benign villi passed into the vaginal vessels, and, having done so, underwent malignant degeneration. In this case the uterus was perfectly healthy. As a rule, chorio-epithelioma of the vagina does not recur, for, owing to the large amount of loose connective tissue in the vaginal wall, free hæmorrhage occurs, followed by the formation of a hæmatoma round the growth, which tends to prevent its spread. In the uterus, on the other hand, owing to the density of its tissues, this protective layer does not form, with the result that recurrence and metastasis are unfortunately of common occurrence. Wehle (*Centralbl. f. Gynäk.*, Leipzig, 1901, S. 1429) publishes two cases of similar tumours, but in both of these recurrence took place with extraordinary rapidity, and death resulted in a very short time.

THERAPEUTICS.

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Carbonate of Creosote in Pneumonia.

During six months eighteen cases of pneumonia were treated in Thomson's wards with carbonate of creosote or creosotal. Of these patients fifteen were males and three females. All recovered except one. In three cases both lungs were affected. Three were alcoholic cases. The case that died was a moderately alcoholic subject, on whom the treatment had no effect, and in whom, before death, the temperature rose to 107°. On the whole, Thomson considers that his cases were of average severity, and he is inclined to ascribe the favourable results to the free use of creosotal. He considers that the drug has a special effect on the course of the disease. It affects the temperature. In twelve of the cases the termination was by lysis. There was frequently a fall of from 1° to 3° within twenty-four hours of commencing treatment, but the next day the temperature rises again, and then remains irregular for several days. The drug relieves tympanites. It is well borne by the stomach. In pneumonia Thomson gives it in 15-gr. doses every two hours night and day = 180 grs. per diem. His favourite mixture is creos. carb., 4 drms., made up with 1 oz. glycerin and 10 oz. aq. menth. pip., the dose being ½ oz. in water. He has never noticed a depressing action on the circulation nor an injurious effect on the kidneys, even if they are diseased. A brief synopsis of the cases is given.—*Med. Rec.*, N. Y., February 1, 1902.

Treatment of Itching.

If possible remove the cause, which may be some article of food, as coffee or tobacco, opium, or the itching may be symptomatic of diabetes or jaundice. The internal remedies used are less useful than local applications. The bromides, antipyrin, and phenacetin, sometimes do well in cases of general pruritus. Gelsemium and jaborandi give relief in case of abnormal dryness of the skin. Salol is useful where the itching depends on the absorption of the products of abnormal intestinal decomposition. The most generally useful local application is carbolic acid, either as a lotion or ointment. An excellent lotion is made by dissolving 30 grs. acid. carbol. in 2 drms. glycerin and 4 oz. of aq. camphoræ. This may be mopped, not rubbed, on, every three or four hours. For small pruritic patches a paste containing phenol 10–15 grs., starch and bismuth sub. nit. āā 2 drms., made up with 4 drms. of vaselin, is most efficient. Next to phenol the most useful antipruritic is menthol. It is best given as a paste or ointment. It should not exceed 10 grs. to the oz., or it may cause a sensation of burning. It is well not to apply it to the face, as it irritates the eyes. Resorcin, in the form of lotion, is useful in moist eczema. Its efficacy is increased by addition of half per cent. of sodium chloride—as resorcin, 30 grs.; sod. chlor., 15 grs.; glycerin, 2 drms.; liq. calcis ad 4 oz. Thymol, ½–1 gr. to the oz., may be used alone, or along with a little liquor potassæ. It is useful in certain forms of senile pruritus. The coal-tar preparations are objectionable from their strong odour and staining properties. The liq. carb. deterg. is one of the best tar preparations. It may be used as a watery lotion, of the strength of 10 to 30 minims to the oz. of water. This is very useful for itching of eczema. For eczema of the anus the best application is liq. carb. deterg., 2 drms.; boroglyceride (25 per cent.), ½ oz.; phenol, ½ drm.; aq. camphor. ad 4 oz. This lotion is also very useful in dry, scaly eczema of other portions of the body. It is too stimulating for acute eczema. Bichloride of mercury is very efficient in itching about the scrotum and perineum, probably by preventing decomposition of sweat. It should be used in the strength of ½–1 gr. to the oz. of water; a stronger solution may cause dermatitis. In obstinate pruritus vulvæ a solution of 10–60 grs. of silver nitrate in 1 oz. of water, or spirit of nitrous ether, may be painted on every second day with a brush. Camphor-chloral similarly applied is often of use. A 5 per cent. oint. of cocaine may give temporary relief.—Hartzell, *Therap. Gaz.*, Phila., 1902, No. 2.

TREATMENT OF SPRAINS BY ELECTRICITY.

IN recent sprains the faradic current should be employed. The secondary coil must be of fine wire. The interrupter should give very rapid vibration. The electrodes are made of carbon, from 6 to 7 cms. in diameter, and are covered with chamois leather. They are applied to opposite sides of the joint. The negative pole is placed over the seat of injury, while the positive pole remains stationary on the other side. The negative pole is moved over the whole of the painful area. Each séance lasts only a short time, between five and ten minutes. The immediate result is removal of pain. After the séance the joint can be moved without pain. The effect passes off in a variable time, and as a rule two applications are needed in the day. Resorption of the exudation is stimulated. By permitting movement, bad results, such as stiffness, ankylosis, and chronic effusions are minimised. In chronic cases the faradic treatment promotes absorption.—Charrier and Planet, *Presse méd.*, Paris, January 8, 1902.

APOMORPHINE IN HYSTERIA.

FAUCHER strongly recommends apomorphine for hysterical attacks. He injects $\frac{1}{10}$ gr., and claims that in this way he is able to cut short hysterical attacks and hystero-epilepsy. The vomiting and subsequent depression have both a sedative effect on the nervous system. One great advantage of the treatment is the saving in time. The doctor can leave the house within fifteen minutes. Faucher has also used this method in cases of true epilepsy. The paper contains several illustrative cases.—*Bull. méd. d. Québec*, January, 1902.

MINERAL WATERS AND BATHS IN CHRONIC NEPHRITIS.

RECENTLY doubts have been thrown on the utility of copious draughts of mineral waters. It has been found that, during comparative good health, diminution in the fluids drunk does not reduce the excretion of metabolic products. In cases where the heart is beginning to fail, restriction in the fluids is frequently beneficial. Grödel has never seen any distinct gain from a course of mineral drinking waters in any form of Bright's, while in many cases he has seen the heart condition become extremely critical. He advocates the use of only a moderate amount of fluid, to prevent the urine becoming concentrated. Too large quantities must increase the work of the kidneys. Whenever the heart begins to fail, he restricts the amount to about 2 pints per diem. In each case the exact quantity is determined by measuring the amount ingested and excreted. Baths have always been largely used in chronic nephritis, to stimulate the skin and thus relieve the kidneys. More recently baths have been advocated for their beneficial effect on the circulation. Great care is needed in the selection of cases. In chronic parenchymatous nephritis, baths increase the albumin and weaken the patient. In such cases the best treatment is a warm climate and gentle cutaneous friction, to stimulate the skin and relieve the kidneys. In primary chronic interstitial nephritis with high tension but little dilatation of the heart, a course of Nauheim baths may do good by reducing the pressure and pulse rate. Grödel uses the carbonic acid saline bath at a temperature of not less than 90°, and a duration of ten to twelve minutes only. Baths are contra-indicated in contracted kidney, secondary to parenchymatous nephritis. The chief beneficial effect of the baths is due to the improvement of the circulation, owing to dilatation of the cutaneous vessels and the general tonic effect. The increased diuresis is due to the improvement in the circulation. To obtain good results the cases must be carefully selected. The following are contra-indicated:—(1) Chronic parenchymatous nephritis, and the contracted kidney resulting from it; (2) advanced arterio-sclerosis with contracted kidney; (3) contracted kidney with much disturbance of the circulation.—Grödel, *Practitioner*, London, December, 1901.

ACTION OF ARGENTUM COLLOIDALE.

COLLOID silver has been warmly recommended in the treatment of septic conditions. Most of the reports have been purely clinical, but recently Beyer has investigated the whole question of the action of colloid silver. Colloid silver can be introduced into the system by inunction, by hypodermic injection, intravenously or by the mouth. The intravenous plan is the best. From subcutaneous injection absorption is slow and silver is often deposited. Per os the best method is to mix the colloid silver with mucilage. In this way 50 per cent. can be recovered from the stools in the original form. This method is of great use in intestinal disorders. After a large dose, injected intravenously, silver can be demonstrated microscopically in the liver, spleen, and intestine, but not in the kidney. For detecting smaller quantities, Beyer acts on the tissues with HCl and pot.-chlor., thus obtaining the silver in the form of the chloride. This is better than the ordinary incineration method. Frequently, within four or five hours of the injection, shivering and rise of temperature has been noted. Beyer considers this due to the physical properties of the compound, and states that it can be avoided by careful filtration. In man, 0·05–0·1 grm. can be given as a 1 per cent. solution without risk. The colloid constitution prevents the salt being too rapidly excreted from the blood, and even after eight to ten hours the colloid silver can be still obtained in the blood. Six hours after injection, there is a leucocytosis. Argyria has never occurred. Excretion is chiefly through the intestine. Within a month all silver is excreted. The chief action of silver on micro-organisms is inhibitory. It is not a bactericide. As the excretion is comparatively rapid, the injection must be repeated in severe cases. In animals it has been given successfully in almost every form of septic infection. In man it is likely to prove especially useful in intestinal conditions, as it retains its activity throughout the whole canal.—Beyer, *München. med. Wchnschr.*, 1902, No. 8.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Formation of Blood Plates.

The numerous papers which have from time to time appeared, dealing with this subject, afford good proof of the greatness of the interest which it has evoked. The various views as to their formation and nature, held by the different observers, show the necessity for further work therein. The majority look upon them as degeneration products of the red blood cells, of the leucocytes, or of the plasma; a few regard them as artificial products, some as a third and independent human blood corpuscle, and a few others decline to commit themselves to any view. Schwalbe has dealt extensively with the subject in his monograph, "On the Clotting of the Blood," Brunswick 1900, but since then several papers of more or less interest have appeared. Two of these may be noticed here, one by Hans Hirschfeld, tracing the formation of the blood plates from the red cells, and the other by Deetjen, advocating their independent origin. Hirschfeld (*Virchow's Archiv*, 1901, Bd. clxvi. S. 195) comes to the following conclusions:—(1) Blood plates are undoubtedly produced by the red cells. (2) Only certain red cells produce them. (3) They are seen as circular discs occupying the very centre of the red cell at first. (4) Later they move to the periphery, and eventually leave the red cell at one spot, less frequently at two or more, where a definite aperture of exit is seen, which closes up again. He has traced them in all steps of their progress, and says that the aperture of exit is generally small, and hence the process of escape is generally slow. For a time they are seen partly outside and partly inside the red cell, the parts being connected by a narrow thread. The outer part becomes gradually larger and larger, the inner becoming correspondingly smaller, until the body entirely escapes, and appears as a free blood plate. He disagrees with those observers, *e.g.* Maximow, who say that one red cell produces only one blood plate, since he has more frequently seen more than one. He further holds that they are not degenerated products of the red cell, and disagrees with those who say that the red cell dies after their production, although he allows that occasionally a red cell bursts like a grenade, giving escape to many blood plates. He next examines the views of Engel, Maximow, and others, that the blood plates are degenerated nuclear remnants of the red cells. He was himself at first inclined to take this view, but abandoned it, after comparing his own results with the appearances described by other observers to occur in the degenerating nucleus of normoblasts, in embryo blood and blood-forming organs, and in the bone-marrow. Their descriptions did not agree with the results obtained by him, and, further, he almost always failed to find blood plates containing red cells in the bone-marrow of freshly killed rabbits and guinea-pigs. He thinks it possible that there may be an interior body or nucleoid lying in the interior of the erythrocyte, different from but having a genetic relation with the blood plates, and that this view is supported by the observation that under certain treatment, *e.g.* after the addition of 5 per cent. acetic acid, this inner body, which may be the remains of the nucleus, and the red cell itself, may disappear, while the true blood plates remain behind. (5) He has observed a similar blood plate formation by the leucocytes, chiefly in the blood in leukæmia, and occasionally though rarely in normal blood. He obtained these results from studying both fresh and fixed and stained preparations, using the results of the one to control the other. Fixation was done by heat, 110° C. for five to thirty minutes. He stained with the following solution for half a minute:—Eosin 0·5 gr., alcohol 60 per cent., 100 c.c. After washing in water, he used the following mixture for ten minutes:—Methylene-blue, B. pat., 1 gr.; Aq. dest., 150 grs. The results are delicate but fleeting, and more lasting preparations can be obtained by staining with Delafield's hæmatoxylin for one to six hours, and then counter-staining with eosin. The blood plates take on the nuclear stain, but, to get good pictures, overstaining must be resorted to. Ehrlich's triacid stain he found to be of no use.

THE STRUCTURE AND RELATIONSHIPS OF BLOOD PLATES.

DEETJEN (*Virchow's Archiv*, 1901, Bd. clxiv. S. 239) has written an even more interesting paper on this subject. He discusses the origin of blood plates in the blood of mammals, from both the red and white cells, and finds them to present more resemblances to the latter than to the former. He is clearly of opinion that they are not degeneration products, but is not prepared to say how they originate. This point is still unsolved. They seem to him to be separate and independent living elements of the blood, and to consist of a nucleus and protoplasm, and to be capable of amœboid movement. This is not possible of demonstration in ordinary fresh blood films, because the blood plates die so rapidly; but it may be seen if they are kept alive for a time in films. He was able to accomplish this by spreading nutrient agar in a thin layer upon a slide, and, when it was sufficiently cool, allowing the blood to fall and spread itself out upon it, and immediately covering it with a cover-glass. It was immediately examined under the microscope on a warm stage. Death of the blood plates still takes place too rapidly for satisfactory examination, but by adding NaCl, $NaPO_3$, and K_2HPO_4 to the nutrient agar in the following proportions: 100 c.c. nutrient agar, 0·6 gr. NaCl, 6–8 c.c. of a 10 per cent. solution of $NaPO_3$, 5 c.c. of a 10 per cent. solution of K_2HPO_4, they may be kept alive for a long time, two or three hours, and their movements studied. These movements he describes as very active, though Hirschfeld found them by the same method to be very slow. The size of the blood plates varies greatly. In healthy blood, it is mostly small, but large forms are met with in disease. The nucleus takes the form of a clear glancing body, which can be stained with nuclear stains, after fixation with 1 per cent. osmic acid or with Flemming's solution. In the fresh films it does not become evident unless the sodium metaphosphate has been added, probably because nuclein may be a combination of metaphosphate and albumin. He thinks that the so-called "spindles" of animals with nucleated red blood corpuscles present close analogies with the blood plates of mammals. He does not say anything more about them, but they are the bodies discovered by Recklinghausen in the blood of frogs, and by Hayem and Bizzozero and Torre in that of birds. These writers, however, describe them as non-amœboid, whereas Deetjen declares that they are capable of amœboid movement. Other observers have noticed them. Löwit classes them with the leucocytes, and Müller as having no relation to either the red or white corpuscle; while Deetjen agrees with Recklinghausen, Gobulew, Schlarewsky, Bizzozero, Hayem, Vulpian, Eberth, and Schimmelbusch, that they are analogues of the blood plates, but students of this subject will feel inclined to withhold their opinion for the present. The evidence so far brought forward is too slight to show that these spindle-shaped bodies are related in this or any way to the blood plates of mammals, from which, indeed, they show such strong morphological differences.

THE PERSISTENCE OF NUCLEI IN THE RED BLOOD CELLS.

PETRONE of Naples has within the last year published papers of great interest, which are all summed up in a final paper, entitled "Ultimate

Researches on the Blood," published in August 1901 (Dagli, *Atti d. Accad. Gioenia di Sc. nat. in Catania*, Ser. 4, tomo xiv.), which have a more or less direct bearing upon the production of the blood plates. He upholds the doctrine that there is not only a definite nucleus remaining within the red blood cell in post-natal life, but there is something else besides. By using various reagents, he shows not only a central nucleus, but another body within that, which he calls a ferrous or iron-containing body. One of his methods is to place a drop of living blood under a cover-glass in a solution of nitrate of silver 1 in 200, and a solution of picric acid 1 in 4000. The red cells, not all of them but a few here and there, show a rounded highly refractile body, lying centrally in some and excentrically in others. In others it has reached the periphery and assumed an ovoid form. It then apparently protrudes a part of its substance outside the periphery of the red cell. This protruded part increases in size until the whole body comes to lie outside the red cell. Many red cells can be seen without a trace of these bodies, but close to them in many places lie some of these highly refractile bodies, leading to the suggestion that they are the same bodies, now extruded, as those seen within the red cells. In further support of this, many of these highly refractile bodies, both inside and outside the red cells, show in their substance a clear shining particle suggestive of a nucleolus. Petrone considers that these refractile bodies represent the nuclei of the red cells, which may be the producer of the blood plates, one by each red cell, although it is possible that there is a separate blood plate producing body as well as the nucleus within the red cell. His most striking conclusions, however, he obtains in another way, namely, by fixing the blood films in absolute alcohol, containing a very small quantity of sulphuric acid, and then, staining with eosin and methylene-blue, he obtains a picture in which the body of the red cell is stained red, and, inside it, there is a clear circular body, remaining colourless or staining blue, inside which again is a bright yellow-stained particle like a crystal. The clear or blue-stained body is the nucleus, and the yellow-stained particle the ferrous or iron body. He claims to have obtained the same results in the red blood cells of fishes, amphibia, birds, mammals, and the human fœtus. He finds that there is a close relationship between the size of this central iron body and its containing nucleus, the latter being very large and it very small in the lower vertebrates; but, the higher we ascend in the scale, the nucleus becomes smaller, and the iron-containing body correspondingly larger, until the highest development is reached in man in post-natal life, where the nucleus is insignificant but this iron-contained body prominent. He suggests that this is in correspondence with the physiological needs of the cells. In the vertebrates with nucleated red cells, the nucleus is preserved in order to subserve reproduction, the chief physiological field of activity shown by the red cells, whereas in the mammalia this field of activity is restricted to fœtal life, and after birth to the bone-marrow, where alone obviously nucleated red cells are found, while the red cell of post-natal life has become specialised to subserve another formation altogether, that of respiration; hence the need for the greater development of the iron body, which is probably the hæmoglobin producer of the red cell. In support of this suggestion, he finds that this central iron body is much diminished or absent in chlorosis and pernicious anæmia. He thinks that it is present in all red cells, but that the ordinary methods of fixation form a layer of coagulated albumin on the surface of the cell, which prevents the central body from being stained or seen. Petrone's results are well worth repetition and investigation. Many of the appearances he describes, particularly the yellow iron body, can easily be obtained by following his methods; but the interpretation he puts upon his results is quite another matter. The appearances of the iron body are so strongly suggestive of an artifact, that the cautious observer will have grave doubts about regarding it as anything else, for the present at any rate.

DISEASES OF THE EAR, NOSE, AND THROAT.

UNDER THE CHARGE OF
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Diseases of the Ear and Upper Respiratory Tracts.

In an elaborate monograph ("Diseases of the Ear and Upper Respiratory Tracts caused by Occupations," Wiesbaden), Röpke discusses the effects of employment upon the ear and upper air passages. In the concluding pages of the work, which must have involved an enormous amount of literary research, he summarises his results as follows:—

EAR.

1. Auricle.—(a) *Eczema.*—Workers in cocoanut wood, cyanide of potassium, asphalte, stoking, iron foundries, galvanising, glass blowing, wood gilding, jute spinning, lime burning, chimney sweeping, furniture polishing, naphtha, paraffin, salt, ropes (tar), Swedish matches (paraffin), coal mines, coal briquettes, tar, weaving, zinc foundries. (b) *Perichondritis.*—Iron foundries, railway stoking.

2. External Meatus.—(a) *Plugging with dust, etc.*—Baking, cement, stoking, iron foundries, lime burning, chimney sweeping, corn mills, emery works, coal mines, trass, ultramarine, zinc foundries, zinc oxide. (b) *Eczema and inflammation.*—Iron foundries, railway stokers, fishing, galvanising, glass blowing, chimney sweeping, corn mills, drivers, porcelain works, steamship stokers, grinding, sailors, soldiers, coal mining, basic slag, weaving, zinc foundries, zinc oxide, sugar refineries. (c) *Ulcers.*—Arsenic, chrome. (d) *Mycosis.*—Sizers (in weaving), washerwomen. (e) *Foreign bodies.*—Bakers, thrashers (corn).

3. Tympanic Membrane and Middle Ear.—(a) *Acute catarrh and inflammation.*—Ammonia, arsenic (in miners), builders, miners, chlorine works, chrome works, sewer cleaning, iron foundries, electric-car conductors, fishermen, raftsmen, hydrofluoric acid works, tanners, glass blowers, lime burners, corn millers, country postmen, sailors, soldiers,

stone breakers, divers, basic slag, trass milling, tunnel workers, washerwomen, brick workers. (*b*) *Chronic catarrh.*—Miners, cement workers, railway servants, ironsmiths, firemen, fishermen, metal polishers, lime burners, chimney-sweeps, corn millers, coppersmiths, emery workers, seamen, spinners, stone breakers, masons, workers with basic slag, trass workers, zinc coaters, washerwomen, rollers (in metal working), weavers, brick workers, zinc foundry hands.

4. INTERNAL EAR.—(*a*) *Affections caused by continuous loud sounds.* —Workers in metallic foil, bleachers, bridge workers, cement grinding, fire-clay grinding, railway servants, coopers, metal polishers, smiths, metal cutters, millers, coppersmiths, musicians, oil millers, porcelain millers, powder millers, sawyers, emery millers, spinners, masons, telegraphists, telephone servants, trass millers, metal rollers, weavers. (*b*) *Affections caused by toxic influences.*—Anilin workers, painters (lead and mercury), arsenic workers, miners (carbonic acid), lead workers, flower makers (lead), ironing (carbonic oxide), potassium cyanide workers, diamond cutters (carbonic oxide, lead), gilders (mercury), firemen (smoke), varnish workers (turpentine fumes), galvanisers (benzin), stokers in gasworks (carbonic oxide), electric lamp makers (mercury), gold smelters (mercury), workers in hare's hair (mercury), Jacquard loom workers (lead), rubber workers (benzin, bisulphide of carbon), tinsmiths (lead), bone dust workers (bisulphide of carbon), cooks (carbonic oxide), brass polishers (spirit), furniture polishers (spirit), naphtha workers, nitro-glycerin workers, oil workers (bisulphide of carbon), patent bottle closers (lead), phosphorus match makers, mercury miners, mercury foundry workers, type-setters (lead), bisulphide of carbon workers, silver smelters (mercury), toy makers (lead), distillers (carbonic acid), tobacco workers (nicotine), workers in tar (benzol), earthenware glazers (lead), weavers (lead and mercury), wool spinners (bisulphide of carbon), zinc foundry workers (carbonic oxide, lead), cinnabar workers (mercury), sugar refiners (carbonic acid). (*c*) *Injuries of the ear.*—Miners (blasting), boxers, caisson workers (changes in atmospheric pressure), chemists (explosions), railway servants (accidents), iron foundry workers (glowing slag), harvesters (straw), workers in explosive works, footballers, smiths (fragments of iron), sportsmen (detonation), coachmen (kicks), balloonists (difference of atmospheric pressure), pearl fishers (atmospheric pressure), picric acid workers (explosions), wrestlers (blows), those who catch performers leaping from a great height, bisulphide of carbon workers (explosions), rifle shots (detonation), soldiers (kicks from horses, detonation), stone breakers (detonation), divers (atmospheric pressure), tunnel workers (detonation, atmospheric pressure), iron rollers (splinters of iron). (*d*) *General affections due to employment in which ear trouble may occur.*—Actinomycosis in harvesters, ankylostomiasis in miners, tunnel and brick workers, foot and mouth disease in cattlemen, scurvy in sailors.

UPPER AIR PASSAGES.

1. ACUTE CATARRH.—*Irritation.*—Workers with accumulators (sulphuric and sulphurous acid), formic acid, anilin colours, anthracite, chemists, builders (coak gases, dry rot dust), workers in benzoic acid and benzol, miners (dynamite gases), amber turners, workers with succinic acid,

bleachers (chlorine, sulphuric acid, acetic acid), workers in lead foundries (sulphuric acid, arsenic), white lead (acetic acid), sugar of lead (acetic acid), breweries (dust of hops), peat (sulphuretted hydrogen), bromine, bronze smelters, bronzers, brushes, canissiers (an occupation implying the removal of leaves from the stems of rushes, the leaves being often covered with fungi), workers in chlorine, chlorinated lime (dust), chromates, Italian warehousemen (dust), confectioners (vanilla), workers in cyanide of potassium (hydrocyanic acid), wire drawers (sulphuric acid), thrashers (corn dust), printers (acetic, pyroxylic acids, turpentine), workers in dynamite, iron foundries, drivers of electric carriages, ivory turners, mussel sorters (ammoniacal emanations), bicycle workers (sulphuric acid), field labourers (guano, basic slag), firemen, varnish workers (pyroxylic acid), galvanisers (benzin, hydrocyanic acid), gas workers (soot), tanners (hydrocyanic acid), gun makers (chloride of antimony), glass blowers, glass workers, workers in glycerin (acrolein vapour), gold refiners (sulphurous acid), workers in verdigris, rubber (amyl nitrite), hammer smiths, stokers, workers of blast-furnaces (carbonic oxide, sulphurous acid, cyanides, sulphuretted hydrogen), wood turners (sawdust, chromates, varnish), workers with pyroligneous acid and with pyroxylic acid, in hops (sulphurous acid, dust), horn turners, hat makers (hair dust), workers in iodine, lime kilns, and caoutchouc, tinsmiths (hydrochloric acid, chloride of zinc), fulminate of mercury workers (acid fumes), bone turners, bone grinders (ammonia, benzin), workers in corn lofts, etchers on copper, drawers of copper wire (sulphuric acid), workers in copper foundries (sulphuric acid), in sulphate of copper (sulphuric acid), japanners (varnish), postmen, servants in country inns (tobacco dust), lime workers (hydrochloric acid), workers in gas (cyanides), in brass (a curious febrile condition seems to attack the workers at first, and during its presence the air passages are affected —also sulphuric acid), metal burners (nitrogenous gases), metal polishers, furniture polishers, millers (dust), workers in naphtha (sulphurous acid, gaseous naphtha), in naphthalin, in naphthylamine, oil works (sulphurous acid), oil varnish (acrolein and succinic acid), paper makers (chlorine), paraffin workers (bisulphide of carbon), makers of tracing paper (acrolein), turners of mother of pearl, furriers (dust), workers in carbolic, picric acid (nitric acid, picric acid dust), in paint brushes, porcelain, gunpowder, mercury, roburite, nitric acid, salt, hydrochloric acid, gun-cotton, emery (lime vapours), sulphur, sword engravers (nitric acid), workers in mustard, soda (sulphuric and hydrochloric acids), spirit (aldehyde, propyl-alcohol), glucose (fermentation gases), steel japanners (varnish), wax taper makers (acrolein, sulphurous acid), makers of briquettes of coal, masons, glazers of earthenware (hydrochloric acid), makers of straw hats, workers in cellulose sulphite (sulphurous acid), in tobacco, tallow melters (acrolein and sulphurous acid), in wall papers (chromates), turpentine, varnish, clay, carpenters, tunnel workers, workers in ultramarine, tin plating (acrolein), wax-cloths (varnish), wool (hydrochloric acid), bricks, zinc foundries, solderers, workers in cinnabar (sulphurous acid), matches (phosphorus, sulphurous acid).

2. INFLAMMATORY PURULENT CATARRH.—Workers in ammonia, painters, workers in arsenic, cleaners of feathers, lead smelters (arsenic), chrome workers, sewer cleaners (ammonia), workers with ice machines

(hydrofluoric acid), fuchsin, tanners, etchers on glass (hydrofluoric acid), fancy wool workmen, rag sorters, workers in nickel foundries, with osmic acid, horsehair, nitric acid, hydrochloric acid, shot (arsenic), sulphurous acid, selenium, super-phosphates (hydrofluoric acid), cushion stuffers.

3. Chronic Catarrh.—Agate cutters, workers in accumulators, ammonia, bakers, miners, amber turners, makers of sheet metal, workers in lead foundries, peat, bronze printers, diamond cutters, turners, dynamite workers, railway servants, workers in iron foundries, conductors of electric carriages, ivory turners, miners, file cutters, fire-proof stone workers, firemen, fishers, raftsmen, workers with hydrofluoric acid, moulders, electro-metallurgists, gas stokers, tanners, glass workers, cart polishers, hammersmiths, workers in horn and hats, coffee roasters, chimney-sweeps, workers in fulminate of mercury, bone turners, cooks, workers in copper foundries and copper generally, in leather, glue boilers, machine makers, brass moulders and polishers, metal sharpeners, workers in naphtha, mother of pearl and furs, upholsterers, porcelain workers, gunpowder makers, mercury workers, sawyers, sailors, slaters, locksmiths, workers in emery, stone breaking, tobacco and wall papers, spinners, makers of crucibles, carpenters, workers in basic slag, clay, trass, zinc platers, washerwomen, metal rollers, weavers, wool sorters, workers in zinc foundries and match makers.

4. Eczema of the Nasal Orifices.—Bakers, workers in carbonite, cocoanut wood, chromates, asphalte, galvanisers, workers in lime kilns, rag sorters, metal sharpeners, sulphur millers, tobacco workers.

5. Nasal Septum.—(*a*) *Erosions and ulcers.*—Arsenic workers, bakers, worsted spinners, bronzers, carbonite workers, miners (metallic ore), gun makers, glass thread weavers, workers in lime kilns, masons, metal sharpeners, workers in emery, Swedish matches, *Schweinfurt* green, tobacco, basic slag, trass and sugar refineries, zinc platers, bricklayers. (*b*) *Perforations.*—Workers in alizarin, arsenic, chromates, cement, wood turners (chromates), nitric acid, hydrochloric acid, emery, Swedish matches (chromates), *Schweinfurt* green (arsenic), ultramarine (sulphuric acid), matches (phosphorus and sulphuric acid).

6. Turbinated Bodies.—*Ulcers and necrosis.*—Workers in chromates, lime furnaces, fulminate of mercury, hydrochloric acid, masons, tinsmiths, and makers of pans.

7. Inflammation of Tonsils.—Makers of accumulators, worsted spinners, miners, workers in sewers, glass blowers, workers in verdigris, iodine, lime furnaces, and basic slag.

8. Concretions in the Nose.—Cement workers and cloth cutters.

9. Anosmia or Defective Power of Smell.—Workers in accumulators (sulphuretted hydrogen), ammonia, lead, bleachers (chlorine), workers in bromine, cement, chlorine works, sewers, varnish (turpentine), hydrofluoric acid, iodine, naphtha, oil mills, nitric acid, hydrochloric acid, knife sharpeners, and workers in bisulphide of carbon.

10. Injuries of the Nose and Accessory Cavities.—Football players, sportsmen, coachmen and grooms, soldiers.

11. General Ailments due to Employments in which the Upper Air Passages may be involved.—Foot and mouth disease (cattlemen), glanders (coachmen and grooms, soldiers), scurvy (sailors).

PUBLIC HEALTH.

UNDER THE CHARGE OF

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THE INFLUENCE OF HOSPITAL ISOLATION IN SCARLET FEVER.

DR. MILLARD (*Pub. Health*, London, No. 5, vol. xiv.) suggests some further points for consideration regarding hospital isolation in scarlet fever. In a former communication, an abstract of which appeared in the November number of this Journal, he came to the conclusion that the hospital isolation of scarlet fever appears to have failed to materially reduce the prevalence and case mortality of that disease, and that the case mortality had fallen most in towns which have not practised isolation. In the present paper he states that the mean attack rate for the past ten years is practically the same in towns with and without isolation, and that isolation does not reduce the number of cases per house attacked. While admitting that the statistics of Brighton are slightly in favour of the cases being fewer in houses where the first case is removed to hospital, he quotes in support of his statement the statistics of Windsor and Bath. During the years 1891–1900, in the former town, with no isolation hospital, the number of cases per house attacked was 1·34; while in the latter, in the years 1890–1899, with 75 per cent. of its cases isolated, it was 1·39 per house attacked. He considers that the explanation of this is that when scarlet fever spreads in a household it generally does so at the outset. He believes from his experience that the average period of isolation in hospital is too long, and in this he is supported by Dr. Simpson, as a result of his investigation on behalf of the Metropolitan Asylums Board. In Leicester Hospital, during the last few months, Dr. Millard has had the scarlet fever patients examined at the end of twenty-eight days. In many the desquamation on the feet has not been completed, but, provided it is not too obvious, he does not detain the patient. During three months ending December 14, 1901, 190 cases have been discharged, the mean duration of stay in hospital being 35·3 days. From these the "return cases" numbered six, or 3·1 per cent. In Birmingham, in the years 1896–1898, the percentage of "return cases" was 3·5, the average stay in hospital being fifty-seven days. He believes "the mere presence of protracted desquamation certainly does not justify any one in pronouncing the patient still infectious." He considers that the number of recorded "return cases" does not give any approximate indication of the proportion of cases sent out from hospital in an infectious condition. In support of this view he cites the case of Leicester, where in 1892, in consequence of the outbreak of smallpox in the scarlet fever hospital, 144 patients, in all stages of the disease, were sent straight to their homes. From these there was not a single "return case." The virulence of scarlet fever carried from hospital must, he thinks, be "exalted," as the case mortality in "return cases" has been stated by independent investigators to be undoubtedly above the average. Having condemned the overcrowding of the wards of isolation hospitals, Dr. Millard asks the question, "Is not the term 'hospital isolation' a misnomer?" and suggests that "aggregation" is a more suitable term. Neither deaths from intercurrent infectious diseases contracted in hospital, nor the cases in which fatal disease is carried to their homes by discharged patients, can be overlooked when considering the efficacy of hospital isolation. In Dr. Millard's opinion, "the only undisputed plea which can be put forward on behalf of hospital isolation, is that it is a *great convenience*"; and if the public realised the risk which aggregation may entail, the sending to hospital of the children of even well-to-do people would not be nearly so popular. The dread of the disease, he thinks, is due to the recollection of it as it was thirty years ago, "and to the excessive though praiseworthy efforts" of the authorities to control it.

EFFICIENCY OF DISINFECTION BY SPRAYING WITH FORMALDEHYDE SOLUTION.

CH. DOPTER (*Rev. d'hyg.*, Paris, tome xxiv. No. 2) gives the results of a number of experiments he has made to test the disinfecting power of formalin solution, used in the form of a spray, and of such strength that its use does not cause appreciable inconvenience to those engaged in carrying out the process of disinfection. His experiments were made on—(1) bacterial cultures fixed by desiccation on paper; (2) on dried pathological products, namely, tuberculous sputum, typhoid and other stools, and diphtheritic exudations; and (3) on the dust of rooms. He at first made use of the solution of formalin and glycerin, suggested by Leslie Mackenzie (*Pub. Health*, London, 1900). This fluid consists of 24 c.c. of commercial formalin and a similar quantity of glycerin per litre of water. Mackenzie stated that this, used in the form of a spray, did not inconvenience the disinfector, but he did not give any certain proof of its efficiency as a disinfectant. Dopter considers the glycerin a disadvantage on account of the moisture which it retains on the surfaces sprayed; and, having proved that it was by no means necessary, he made use of the following solution:—

Commercial formalin (40 per cent. formaldehyde)	24 c.c.
Water	976 ,,

Little strips of sterilised paper were impregnated with various bacterial cultures, and dried *in vacuo*. One set was sprayed for thirty seconds with the formalin solution, and the other set, to act as controls, was sprayed for a similar time with sterilised water. The strips were then protected from dust and left to dry in the air of the laboratory. Pieces of the paper were taken at intervals, varying from five minutes to twenty-four hours, and, having been lightly washed in ammoniacal water (sterile water 10 c.c., ammonia 3 drops), to remove the last trace of formaldehyde, were cultivated in bouillon and incubated at 37° C. The control pieces were similarly treated, cultivated, and incubated, and in every case showed growth within thirty-six hours. It was found that five or fifteen minutes' action of the formalin solution only slightly modified the vitality of the organisms. After two to six hours' action, however, their development was greatly retarded, and when the solution had acted for twenty-four hours, *B. diphtheriæ*, *B. coli*, *B. typhosus*, *B. pyocyaneus*, *Streptococcus pyogenes*, etc., were killed *Staphylococcus pyogenes*, and the spores of *B. anthrax* and *B. subtilis* were often but not always destroyed. When not destroyed, their development was always retarded. Papers thinly coated with fæcal matter from cases of typhoid fever and dysentery were dried *in vacuo*, and similarly sprayed for forty seconds, and after varying intervals washed in ammoniacal water and cultivated. Control papers were employed as before, and in all cases gave growth within twenty-four hours. In eight experiments out of ten, made on dysenteric stools, portions of the paper, tested twenty-four hours after spraying with formalin, gave no growth; and in seven out of ten experiments with typhoid stools, no organism could be got to grow when similarly tested. As regards diphtheritic exudation, similarly dried, it was found that a contact of six hours with the formalin solution did not always suffice to kill the diphtheria bacilli or the accompanying staphylococci, but that twenty-four hours' contact produced absolute sterilisation. Silk threads were next impregnated with tuberculous sputum, very rich in tubercle bacilli, and dried *in vacuo*. Some were sprayed for thirty seconds with the formalin solution, others for the same time with sterile distilled water. After twenty-four hours they were washed in ammoniacal water, and introduced into the peritoneal cavities of guinea-pigs. Of the seven animals into which the threads treated with formalin were inserted, six were killed, at times varying from forty-five to eighty-four days after inoculation, and no tuberculous lesion was found. The other guinea-pig died on the thirty-eighth day after inoculation, and no tuberculous lesion was found. Of the seven inoculated with the control threads, five died in from forty-five to fifty-seven days after inoculation. The other two were killed on the fifty-fifth and sixtieth days respectively. In all seven animals tuberculous lesions were very marked.

The investigations as to the effects of spraying the solution on the dust of rooms were carried out in various apartments of the Ecole Polytechnique, with the spray of Geneste and Herrscher. The places chosen were on walls and tables, and preference was given to those where the dust was thickest. The samples of dust taken before disinfection contained moulds, *B. subtilis*, *B. mesentericus*, *B. coli*, *B. fluorescens putidus*, staphylococci, streptococci, and sarcinæ. Twenty-four hours after the spraying with formalin solution, there were still present, though in much smaller numbers, moulds, *B. subtilis*, *B. mesentericus*, and sometimes staphylococci, of which the resistance to antiseptics is greater than is generally supposed. Non-sporebearing bacilli had always disappeared. From these results it will be seen that absolute sterilisation of dust *in situ* is not attained, but the method must be regarded as very satisfactory, and for practical purposes sufficient, as it insures the destruction of ordinary pathogenic organisms. In order to produce efficient disinfection, formalin spraying must therefore be done slowly, regularly, and in such a manner that the surfaces to be disinfected are thoroughly wetted. After the spraying, the room should be kept closed for twenty-four hours, the joints of doors, windows, etc., being made as air-tight as possible. The foregoing experiments show that this time is necessary to insure destruction of ordinary non-sporebearing micro-organisms. The apartment is then opened, freely aired, and the following day the odour of formalin has entirely disappeared. The spraying, so far as the disinfectors are concerned, only produces a slight tingling of the nasal and ocular mucous membranes, which does not really inconvenience them. To minimise this effect, the doors and windows may be left open during the spraying, and shut whenever it has been finished. The proceeding is simple, inexpensive, and requires no special apparatus beyond the spray.

The Use of Preservatives and Colouring Matters in Foods.

The Report by the Department Committee appointed in July 1899, to inquire into the use of preservatives and colouring matters in the preservation and colouring of foods, has lately been issued, and contains a large amount of interesting and valuable information. In connection with the inquiry, a large number of articles of food and drink, 4251 samples in all, from the larger towns of the United Kingdom, were specially examined at the Government Laboratory. Of these, 1659, or 39 per cent., were found to contain preservatives; 320 containing salicylic acid, twenty containing formalin, and 143 sulphites.

The percentage of food samples found to be "preserved" in different towns varied very much. In London it was 42·7 per cent., in Belfast 30·4 per cent., in Edinburgh 38 per cent., and in Sheffield 54·7 per cent. In the case of milk, preservatives are more frequently added in summer than in winter, Dr. Hill of Birmingham stating that 5 per cent. of the samples examined by him in winter had had preservatives added, while 18 per cent. of the samples in summer had been similarly treated. In the four and a half years ending September 1900, he examined specially for the presence of preservatives, 1877 samples of milk taken in Birmingham, and 10 per cent. of these contained either boric acid or formaldehyde. In other parts of the country preservatives seem to be less frequently added to milk, but in others they are employed to a much greater extent, the frequency of their employment apparently depending on the attitude of the Local Authority towards their use. Thus, in Leeds, Dr. Spottiswoode Cameron stated that in the month prior to his giving evidence, of forty-nine samples examined, twenty-five contained boric compounds of some kind.

Samples of cream bought from dairies are less frequently "preserved" than those bought from grocers, and the majority of "potted" creams contain a preservative at all times.

In butter, preservatives are more frequently added in winter than in summer. Out of 1393 samples sent by the Customs and examined in the Government Laboratory during the year ending March 1900, 22 per cent.

of those received from April to September contained preservative; while 34 per cent. of those from October to March had been "preserved." These percentages are practically identical with those found by Dr. Hill in samples taken by him in Birmingham.

As regards the amount of different preservatives present in various articles of food—Boric acid, in milk, varied from 1·3 to 9·1 grs. per pint; in cream, from 10 to 57 grs. per pint; in butter, from 18 to 65 grs. per pound; in bacon, from 8·6 to 46 grs. per pound; and in sausages, etc., from 15 to 66 grs. per pound. Sulphites were found in lime juice, ginger wine, lemon syrup, etc., in amounts (as sulphurous acid) varying from 0·1 gr. to 4·5 grs. per pint; and in imported beers, from 0·2 to 1·6 gr. per pint. The accurate determination of the amount of formaldehyde present in a food is difficult, on account of the change which the substance undergoes, and the reporters are of opinion that the results obtained give no real idea of the amount which may originally have been added. Dr. Collingwood Williams, public analyst, Liverpool, stated in evidence that the greater number of jams contained salicylic acid, and that the amount of that substance used in some temperance drinks was "perfectly astonishing"—lemon squash containing sometimes 50 grs.; ginger wine from 49 to 113 grs.; orange wine from 94 to 106 grs.; and black currant wine from 47 to 140 grs. per gallon.

Mr. Vasey, who has been employed for the last ten years to examine foods, etc., for the *Lancet*, said that "practically all the samples of invalid food which he had occasion to analyse contained chemical preservatives," though more recently he had found certain of them free from them.

In the portion of the report which deals with colouring matters there is little of general interest. Indeed, the committee state that, while they are of opinion that articles of food are better in their natural colours, they have been unable to deduce from the evidence laid before them any injurious results attributable to the use of articles of food coloured to improve their appearance. Their opinion seems to be that the quantity of any "coloured" article eaten is too small for the person eating it to be injuriously affected. They, however, recommend the prohibition of the use of the salts of copper for the "greening" of preserved foods, *e.g.* tinned green peas, a recommendation from which Dr. Tunnicliffe dissents.

The committee recommend—(1) The absolute prohibition of the use of formalin in any food or drink, and that salicylic acid be used in not greater amount than 1 gr. per pint in liquid, and 1 gr. per pound in solid food—its presence in all cases to be declared; (2) that no preservative or colouring matter whatever be permitted in milk offered for sale—the addition of such to be constituted an offence under the Sale of Food and Drugs Acts; (3) that the only lawful preservatives in cream, butter, or margarine should be boric acid or a mixture of boric acid and borax, the amount not to exceed, in the case of cream, 0·25 per cent., and in the case of butter or margarine 0·5 per cent. (stated as boric acid); (4) the absolute prohibition of chemical preservatives of all kinds in dietetic preparations intended for the use of invalids or infants; (5) that the use of copper salts in the "greening" of preserved foods be prohibited; and (6) that means be provided to exercise supervision over the use of preservatives, etc., in foods, and to prepare schedules of such as may be considered inimical to the public health.

REPORTS OF THE MEDICAL SOCIETIES.

Glasgow Medico-Chirurgical Society, *April* 4, 1902.—Dr. **Kerr Love** showed cases illustrative of the mastoid operation, in which skin grafting of the tympano-mastoid cavity had been performed. All the patients had suffered from chronic discharge from the ear. In the course of the operation all diseased tissue is thoroughly removed, and the wound over the mastoid stitched. This wound is taken down at a later stage, and the skin graft is introduced on to the bony surface. After all moisture has been removed, gold leaf is laid over the graft, and the wound is once more stitched up. Dr. Love claims that the period of convalescence was much shorter than after the old operation, and that there was no deterioration of hearing.—Dr. **Alex. M'Lennan** showed two cases of removal of the superior row of the carpal bones in acute septic arthritis of the wrist-joint. For the relief of this condition the superior row of carpal bones was removed. In one case considerable latitude of movement was obtained. In the other, as the wrist still remained stiff a year after the operation, the extensor tendons were freed and surrounded with films of gelatin; but as the wound became septic, little improvement was obtained.—Dr. G. F. **Fergus** gave an account of the recent outbreak of plague in the Central Hotel.

Glasgow Pathological and Clinical Society.—The seventh ordinary meeting of the session was held in the Faculty Hall on the 14th inst., the President, Mr. H. E. **Clark**, in the chair.—Mr. **David Newman** gave an account of—(*a*) A case of old standing calculous pyonephrosis with symptoms of recent acute intestinal obstruction, which presented difficulty in diagnosis. The obstruction was due to the descending colon being compressed between the kidney and the abdominal parietes. (*b*) An interesting case of non-suppurative perinephritis.—Dr. **James** H. **Nicoll** showed—(*a*) An infant operated on for intestinal obstruction due to a pelvic cyst; (*b*) an ovary and Fallopian tube which occupied the upper portion of the labium of a female infant, and ultimately became strangulated by torsion of the pedicle, simulating strangulated hernia; (*c*) specimens from three recent cases of perforated gastric ulcer; and described (*d*) four cases of operation for affections of the gall bladder; (*e*) a case operated on for femoral hernia.—Dr. **Laurie** (Greenock), showed—(*a*) Case of prostatectomy; (*b*) a case of fractured pelvis with ruptured bladder; (*c*) gall stones removed by cholecystotomy.—Mr. **Maylard** showed a fungating sarcoma of the lower end of the femur.

OBITUARY.

Patrick Thurburn Manson, M.B. Lond.

We deeply regret the sad news of the death of the eldest son of Dr. Patrick Manson, by an accident, which took place soon after his arrival at Christmas Island, whither he had gone with the Commission to report upon Beri-beri.

Dr. Thurburn Manson was a student of Guy's Hospital, and, after graduating at the University of London, he proceeded to study pathology under Professor Hamilton in Aberdeen. He afterwards joined the School of Tropical Medicine in London, and acted as House Surgeon to the Seamen's Hospital, Albert Dock. After this careful training it seemed that no one could more fitly form part of such a commission as was sent to Christmas Island in the end of 1901. Young Manson was not merely enthusiastic in the pursuit of knowledge, but he proved in the most practical way his devotion to the cause of science. When Dr. Patrick Manson determined to test the accuracy of his views regarding the transmission of malaria, he was anxious to allow infected mosquitoes to attack healthy people in this country. Dr. Thurburn Manson at once volunteered to allow himself to be bitten, and it will be remembered by all that the experiment was successful, and that he became infected with malaria.

Dr. Thurburn Manson was a man of great physical powers, high mental abilities, and sterling personal character, possessing, moreover, fervid enthusiasm for his work. There can be no doubt that he would have made valuable contributions to that department of medicine which is adorned by his father. His death can only be regarded as a great loss to science in general, and to that of this country more particularly. Deep sympathy is felt with his family in their sore bereavement, and especially with Dr. Patrick Manson, whose hopes are shattered by this cruel blow.

Edward Long Fox, M.D. Oxon., F.R.C.P. Lond.

By the death of Dr. Long Fox, which occurred on Friday, 28th March, Bristol has lost one of her most prominent and most valued citizens.

Edward Long Fox was born near Bristol in 1832, and educated first at Shrewsbury School, under Kennedy, and later at Balliol College, Oxford, under Jowett. Having taken a First Class Bachelor's Degree in the Natural Science Schools in 1854, he entered as a student at St. George's Hospital, and graduated as M.B. in 1857, and M.D. in 1861. Soon afterwards he began to practise in Bristol, and was elected Physician to the Royal Infirmary, a post which he held for twenty years. He was also for some years Lecturer on Medicine in the Medical

School. An enthusiastic teacher, his influence in the Bristol School was very great. He was the author of many original papers of real value, and his work on the sympathetic system is a standard volume. Dr. Long Fox was a warm advocate of the temperance movement, and was for some time President of the National Temperance League. He also showed his interest in the public health by furthering the aims of the National Association for the Prevention of Consumption, and was Chairman of the Gloucester, Somerset, and Wilts Branch almost up to the time of his death.

The friend of Jowett, Percival, Acland, Clark, and Symonds, Edward Long Fox was no ordinary man. Although by no means in his element as a medical politician, he took a keen interest in all that pertained to the highest aims of the medical profession. When the British Medical Association met in Bristol in 1894, it was but fitting that he should be its President, and he performed the duties of that high office with a dignity of bearing and geniality of manner which gave the keynote to that memorable meeting. For some time his health had been failing, but with brave self-abnegation he prosecuted his professional work almost to the end. He has left behind him the memory of a high-minded Christian gentleman.

ANALYTICAL REPORTS.

Cathay Tea.

(Cathay Tea Company Limited, London.)

Cathay tea is of Chinese origin, a pure China tea. It is not so strongly flavoured as teas of Indian growth are, but is more delicate. The fear is, that the widespread indulgence, on the part of tea-drinkers, in the strong and pungent varieties of teas obtained from India and Ceylon, may have rendered the palate of the public less fit to properly recognise delicacy of flavour, or to approve of a presence of much less tannin by reason of the consequent lack of tartness. The chief disadvantage of Indian teas, for invalids, or for all those of weak digestion, lies in the ease with which their infusions may become too strong; over-long infusion of Indian teas results in the production of an astringent, irritant, as well as stimulant mixture; infuse China tea ever so long, and you will never obtain a solution sensibly capable of doing direct damage to the bodily functions or tissues.

To taste, Cathay tea prepared *more probato* is clean, and delicately pleases the palate. However prolonged its infusion, astringency and bitterness are awanting; although equal in stimulating power to Indian and Ceylon teas. On cooling, very little or no deposit forms.

For cases with mal-digestion of gastric origin, and for all confirmed tea-bibbers, a pure China tea such as this is much better suited than teas of heavier nature, yielding, when infused for long (as is but too common), a protoplasmic poison in solution. Cathay tea is worth remembering.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FIVE WEEKS ENDING MARCH 29, 1902; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	39°·1	*[1] 76° [2] 142°	172° 504°	2·5	7·4	116	215	3°·0
Observed	40°·9	[1] 88° [2] 127°	123° 558°	2·2	4·8	93	190	3°·0
Difference	+1°·8	[1] +12° [2] −15°	−49° +54°	−0·3	−2·6	−23	−25	±0°

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING MARCH AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1340 [2] 3925	223 217·7	256 707	42·6 39·2	127 364	21·1 19·9	295 900	49·1 49·9	151 429	25·0 23·8
Actual Deaths and Rate per 10,000	[1] 1425 [2] 3881	237 215·3	237 713	39·5 39·5	154 453	25·6 24·8	341 862	56·7 47·8	168 414	27·9 23·0
Difference from Mean	[1] +85 [2] −44	+14 −2·4	−19 +6	−3·1 +0·3	+27 +89	+4·5 +4·9	+46 −38	+7·6 −2·1	+17 −15	+2·9 −0·8

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 79 [2] 231	13·2 12·8	34 94	5·6 5·2	112 330	18·6 18·3	135 363	22·4 20·0	53 159	8·9 8·9
Actual Deaths and Rate per 10,000	[1] 82 [2] 238	13·6 13·1	25 97	4·1 5·3	174 417	29·0 23·1	120 325	19·9 17·9	55 185	9·2 10·4
Difference from Mean	[1] +3 [2] +7	+0·4 +0·3	−9 +3	−1·5 +0·1	+62 +87	+10·4 +4·8	−15 −38	−2·5 −2·1	+2 +26	+0·3 +1·5

* NOTE.—The figures [1] denotes the data for March, [2] for year to date.

The five weeks ending March 29, 1902, were warmer than usual, due both to increase in actual day-degrees of warmth, and decrease, somewhat more marked, in day-degrees of cold experienced. The rainfall during these weeks was slightly deficient; the total hours of bright sunshine recorded considerably below the average; the mean daily variability of temperature equal to the mean.

The first thirteen weeks of 1902, despite the increase in warmth during the last five of the series, show a lack of normal heat and an excess of cold; a shortage in rainfall equal to 35·1 per cent.; and deficient sunshine.

During March the total number of deaths registered in the four large towns discussed exceeded the mean for the month by 6·3 per cent.; this increase was chiefly due to the excessive mortality from pneumonic diseases, over 55 per cent. above the mean, and in smaller degree from circulatory and nervous causes. The increase recorded under diseases of the respiratory organs is more than accounted for by the above-noted excess of deaths from pneumonia. Constitutional, urinary, and phthisical causes yielded a decreased mortality.

Influenza was given as the direct cause of death in sixty-six cases—a larger number than for twelve months back.

The total number of deaths for the three months is still below the normal; deficits occur under respiratory, phthisical, and nervous causes; large increases under circulatory and pneumonic diseases; less marked under the remaining classes. The circulatory deaths show increase of 24·4 per cent., the pneumonic 26·3 per cent. over the average figures.

EDINBURGH MEDICAL JOURNAL.

CURRENT TOPICS.

The Megrims and the Foramen of Monro.

A GIBE is frequently directed against the doctors' "trade," so termed by the envious, to wit, that unrivalled facilities are offered to those professing the same for the imagining of vain things, and scope for special pleading in support of their hypotheses.

Ad hoc Dr. Spitzer of Vienna has issued a monograph on "Megrim," wherein the origin of the disease is categorically affirmed to consist of absolute or relative narrowing of the foramen of Monro. From constriction of the blood vessels passing through the said foramen, under certain conditions, disturbances of blood pressure and blood flow are produced in many parts of the brain, quite sufficient to account for the eye symptoms, the oculomotor pareses—in fact, for the whole "nerve storm" of Liveing, which characterises an attack of migraine.

Hypothetically, he demolishes all the hypothetical explanations advanced by previous authors; hypothetically, he proves first that his own hypothesis is impossible, then proceeds to argue still more hypothetically that it is the only possible explanation.

How the foramen takes upon itself to contract and expand again before and after a paroxysm, or what the cause of these antics may be, still remains dubious.

Hereditary Predisposition in Phthisis.

DR. CLAUD MUIRHEAD ("Report on the Causes of Death among the Assured in the Scottish Widows' Fund") has made an interesting investigation into the subject of family predisposition to phthisis amongst those (males) dying from this disease during the years 1874–94.

The total number of deaths from phthisis embraced in the inquiry amounted to 524, and, for comparison, 502 deaths from apoplexy were taken and are referred to as "non-consumptives."

Among the "consumptives" it was found that parents were admittedly tuberculous in 8·39 cases, but this percentage was increased to 15·26, if those cases were added in which subsequent inquiry afforded good grounds for the suspicion of the tuberculous taint in one or other of the parents. If, further, the existence of tuberculosis among sisters or brothers is taken into account, then the total number with a history of family taint was 182, or 34·72 per cent.

On contrasting the family history of the "non-consumptives" with the above, the following figures were obtained:—Parents admittedly tuberculous 7·37 per cent., increased to 13·15 per cent. by parents possibly consumptive; while, on adding those with tuberculosis among brothers or sisters, the total percentage with a history of family taint, acknowledged or probable, was 47·21. In other words, there was actually a larger percentage of members with consumptive relatives among those who actually died of apoplexy, than among those who ultimately died of phthisis. The logical conclusion, Dr. Muirhead says, in summing up his consideration of the whole question of hereditary predisposition in relation to phthisis, is, that in the adjudication of a proposal with a family history of phthisis, while we cannot discard from our minds such history as a predisposing cause of the disease, we must attach a much less degree of importance to it than has been the practice in former days.

The Increase in the Mortality from Cancer.

As is well known, statistics indicate that cancer has been increasing in the United Kingdom during recent years. The reports of the Registrar-General show that the death-rate from cancer among the general population (males) of England increased 38 per cent. in 1881–90, as compared with 1871–80. This increase has been alleged to be more apparent than real, being due, it is stated, in great measure to improved diagnosis. The fact that the increase has been much greater among males than among females is held to support this view. In the admirable report (" The Causes of Death among the Assured of the Scottish Widows' Fund and Life Assurance Society (1874–94)") by Dr. Claud Muirhead, which has been recently issued, these views as to the explanation of the increased cancer mortality are ably combated.

The report shows that in the three septennia embraced in the period dealt with, the death-rate among members from cancer increased 4 per cent. from 1874–80 to 1881–87, and 27 per cent. from 1881–87 to 1888–94; and Dr. Muirhead says that the theory that the latter large increase was wholly or even largely caused by a sudden increase of diagnostic skill among the class of medical men who usually certify causes of death to the Society, is untenable. He further proceeds to show that the proposition, that the increase of cancer is only apparent owing to better diagnosis of "internal" cancer, is not borne out by the statistics of the Society, since the percentage of deaths from internal cancer decreased to the extent of 7 per cent., whereas those from cancer of external organs increased by 18 per cent., in the third septennium as contrasted with the first.

A point of considerable interest in relation to cancer is also brought out by those statistics, namely, that the age-period at which death is most frequent is gradually declining, or, in other words, sufferers from cancer die at an earlier age. In fact, whereas the average age at death from all causes rose a little over two years within the twenty-one years covered by the report, the average age at death from cancer declined by two years, namely, from 61·9 in 1874–80 to 59·9 in 1888–94.

The Town Council and Public Health.

IT must have been obvious to the most careless observer of current medical events, that, in view of the recent decision of the Town Council, the Royal College of Physicians of Edinburgh could not longer maintain its arrangement with the former body for the bacteriological diagnosis of disease. To have continued to accept fees from the Town Council after the disparaging remarks made by certain members of that body, would have argued a degree of resignation calculated to arouse the despairing admiration of every division of the militant Church, or a depth of servility that would richly merit the contempt of all public-spirited men. Fortunately for the medical profession, the College has been found jealous of its own honour, and true to the best traditions of medicine. The exact terms of its final communication to the Town Council have not transpired, but the nature of that document may be inferred from a graceful letter addressed, on behalf of the College, by its Secretary to the members of the medical profession. In that circular the College expresses its cordial appreciation of the loyal attitude of the profession, and states that, while it has resolved to cease reporting upon morbid specimens sent through the Medical Officer of Health after 15th May, it will revert to the former practice and furnish reports after that date directly to the members of the profession. This is the only attitude which the College could take up with any respect for itself, and it will be a source of sincere congratulation that it has taken up this position.

Nurses and the "Nineteenth Century."

WHEN you are anxious to make a fine appearance in a monthly review, it is always more picturesque to go in for sweeping generalisations than to content yourself with discriminating distinctions—besides, it is much easier. We have no doubt that Miss Johnston was aware of this fact when she helped to fill up the *Nineteenth*

Century for April with her contribution on "Nurses," and we have no fear in believing that Mr. Knowles was quite pleased to keep the ball rolling by accepting Mr. Holland's and Mrs. Stuart's excellent, though perhaps unnecessary, replies in the following number. Do any of these articles bring us any "forarder"? We doubt it. Miss Johnston evidently is bred to respect only saints and heroines, and is impatient with mere humanity. Let her try her hand on doctors, lawyers, clergymen, or the men of Grub Street, and she will find a task as simple as the one she has floundered in. Any one of us, given three sheets of foolscap, a fair memory, and twenty minutes to spare, could, out of his experience, construct a medical man from whom the pious would shrink with horror—a man who had an inordinate taste for penny points at bridge, who on occasion was not superior to two rummers of whisky and potash before he turned into bed, who might even entertain a charming Terpsichore to supper at the Carlton, and be found reading his "Decameron" while driving in his brougham from a case of malignant disease to a childbirth. This same gentleman, on examination, is not unlikely to prove a most excellent physician, but it might not be politic to say so in the pages of the *Nineteenth Century*. Miss Johnston had no doubt a worthy object in view, when she called to her aid her sweeping waves of criticism and scorn, and we seriously have no objection to her outcry, if we believe that a little good may come out of it all. Enthusiasts and reformers cannot afford to mince words, and truth need not be handled delicately. Her picture of the typical nurse—as ignorant, over-worked, frivolous, garrulous, down-trodden—may serve as the flaming poster to advertise certain quite excellent wares which we have found buried in a mass of shoddy in her elastic reticule.

Let us admit that we have met nurses who are ignorant, absolutely wanting in imagination, more given to flirting than consoling, quicker with their tongues than with their hands. But these constitute the great exceptions. We hold no brief for the nurses, except the brief of common justice and humanity; neither do we wish to pose as the devil's advocate. Nursing is a profession—honourable, difficult, and responsible. To its ranks come women of all classes, all temperaments, all ambitions. Such being the case, it cannot but result that we are faced, not only by anachronisms, but by glaring inconsistencies. But at the same time we believe the balance to be markedly on the right side. In no profession can we find more self-sacrifice, more control, more generosity, more earnest desire to do good. Want of insight and want of knowledge there may often be, but seldom want of patience and want of kindness. Miss Johnston may mourn the absence of a quasi-hysterical sympathy and the presence of a loose tongue. The first negative condition is a blessed grace; the second affirmative one is not a monopoly of the nursing class.

As far as the world goes, nursing is a thankless occupation. The nurse is neither given the privileges of the aristocrat nor can she attain to the comforts of the plutocracy. Her doings are not advertised in the open ways of life. Her virtues are taken for granted, whilst her vices form part of the tea-tattle of a horde of vacant-brained and vacant-souled women, whose interests never soar above their servants, their dresses, and their diseases. If we cannot enrol the typical nurse in the volume of the Saints, we can at least give her an honourable place in the heart-stirring roll of humanity.

Not that we have much sympathy with the noble army of the "well-intentioned." The person who only means well is to be avoided as a rule, and we do not wish it to be understood that we are particularly tolerant of ignorance, or undecided as to our views upon competence. Not for an instant should a false idea of kindness perpetuate incompetence in the ranks of the nursing profession. The non-survival of the unfit is a cruel though a necessary law, and he is but a poor friend of humanity who would dare to oppose the law in the pursuit of a pathological altruism. Efficiency is a useful word in other economies as well as in politics. But efficiency does not necessarily imply perfection, although it certainly does imply progress. It is difficult, we know, to get the true perspective of the matter, and in an age which is armed with the deadly weapons of "half truths" it is difficult to reach the proper balance of things. Miss Johnston is not one of the persons we should take as a good guide to facts.

The Teaching of Anatomy and Physiology.

THE time is not far distant—if indeed it is not actually at hand—when those engaged in the teaching of anatomy and physiology to students of medicine will have to consider the position which these subjects are to hold in the medical curriculum, and in their relations to medicine and surgery.

The present tendency is to teach these subjects as abstruse sciences, far beyond the heads of the auditors, and altogether apart from their practical bearings. Paradoxical as it may sound, it is nevertheless true, that the modernly trained student knows nothing of either the elements of physiology or of its practical relations to medicine; whilst the same may be said of anatomy, but more particularly of anatomy as applied to surgery.

For this state of affairs the teachers of these subjects must be held primarily responsible; minor contributing causes being the effete system under which these subjects are taught, and the lack of interest displayed in them by the practical side of the profession.

If the teacher of anatomy or physiology is to be a pure scientist, with no medical or surgical knowledge whatsoever, as is the modern tendency, then the student cannot be blamed, if, like his teacher, he too knows nothing of the practical applicability of what he learns, and still less can he be blamed if he fails to grasp the details of a life-long study in the fleeting space of some nine or twelve months.

Any system which encourages a student to cram up simultaneously the elements of surgery with what ought to have preceded that science—anatomy, physiology, and pathology—and at the same time permits him to struggle with the intellectually interesting, but otherwise somewhat unnecessary, First Professional subjects, must obviously be held responsible for the ignorance displayed by students as to the practical side of anatomy and physiology.

It is hard to realise that a practitioner of medicine is better equipped for the battle of life by his having been taught by an enthusiastic but practically ignorant teacher, the origins and insertions of the muscles of the back, the history of physiology from the time of Eve, the poking of electrical needles into an alarmed frog, and so forth. Yet all this and more is gravely insisted upon, and the medical profession make no protest, beyond wondering over an evening pipe, as to why a student is so ignorant of all that pertains to the practice of his profession, in the wide domains of anatomy and physiology.

The answer is not far to seek—he has never been so taught.

The Medical Council.

THE ways of the Medical Council are passing strange. Generally speaking, we take it that the duty of that august body is to keep a clean register; not content with that, however, they have undertaken a mild dictation to the various educational and examining bodies throughout the country. This supervision has taken the form of a series of "recommendations," which fortunately or unfortunately the Council has no power to enforce.

The recent revolt of the English colleges against the enactments of the Council is likely to bring matters to a crisis. No one with any knowledge of the facts would call in question the sufficiency of the standard of examination exacted by the Conjoint Board of England. Yet, simply because these and other educational bodies decline to act in accordance with the "recommendations" of the Council, propositions are brought forward, submitting that the men who have passed these examinations are not qualified to practise their profession. If, as we are informed, these propositions were introduced with the intention of bringing matters to an issue, and so settling once and for all the powers of the Council, well and good. Unfortunately, however, these proposals have been shelved, at least for the time being, and the Council is likely to go on its way expressing pious opinions on subjects over which they have no direct control.

The Rhodes Scholarships.

EXCEPT that it has been well advertised, the Oxford Medical School, if one may use such an expression, does not seem likely to profit immediately by the munificence of Mr. Rhodes. The comparison drawn between Oxford and Edinburgh, in the now famous will, naturally emphasises the difference between the two schools. Hitherto Oxford, unlike Cambridge, has not affected to provide instruction in the practical or clinical aspects of medicine, except in the most elementary form, but has exerted all her energies in raising the standard of the preliminary and scientific parts of a medical man's education. Whilst the foundation of a clinical school at Oxford may, for obvious reasons, be regarded as at present impracticable, yet the "Empire Builder," of all others, should have realised that many of the obstacles might have been overcome by liberal endowments and increased hospital accommodation. Though curious that this practical side of the question should have escaped Mr. Rhodes' notice, perhaps his executors may still be able to give some form of support to the testator's wishes.

Liverpool University Fund.

IN response to an appeal issued by the Lord Mayor of Liverpool for £330,000 for the University Fund, the sum of £160,000 has already been collected. Magnificent though this sum is, it should not be taken as a proof that there is a wide-spread desire for the proposed university, for an examination of the list of subscribers shows that the movement has affected only a small circle of wealthy people. Liverpool has a population of nearly seven hundred thousand, of whom less than two thousand have contributed to the fund. In spite of the generous subscriptions of a few, the small number of individual subscribers is a singular commentary on the much circulated statement that there is a great popular demand for a separate university. A closer scrutiny of the list of subscribers shows, too, that the persons who have contributed most handsomely are least likely to send their sons to a small provincial university.

Meantime the municipal authorities are petitioning the King in Council for a charter upon which to found the university. Strenuous opposition is likely to be offered, and for the sake of Victoria University it is to be hoped that this untimely demand will not be granted without full consideration of all the interests concerned.

A Bowel Boom on the Medical Exchange.

GIVEN that the values attached by medical men to the causes and nature of different diseases represent, on the medical market, the equivalent of stocks and shares on the regular Stock Exchange, very similar fluctuations in the prices current from time to time may be said to be exhibited by the former. On the Medical Exchange this stock or that constantly varies in worth, is constantly rising or falling in the estimation of the medical brokers (*i.e.* experts), and consequently also in that of the medical investors (*i.e.* practitioners). Venesection, for example, at one time was valued far above its real worth; invested in, and believed incapable of depreciating, is now a drug on the market, and really under its proper level. Look again at violent catharsis, confidently appraised some years ago at a ridiculously high price, now seldom quoted.

Only a score of years ago the business done in the Digestive Circus of the Medical Market, to borrow another metaphor from the Exchange, was almost entirely devoted to transactions in gastric and hepatic securities. Maldigestion stocks as a group were only dealt in when the stomach and liver were involved. To-day, and in recent years, the position of gastric stock has fallen decidedly, partly from competition and appreciation of rival interests, the importance of which has only lately been recognised. The most vigorous of these new rivals have to do with the bowel, and have gained in credit as prominent a part as played by the stomach formerly in the affairs of maldigestion. Witness the recent publications of Boas, Einhorn, and Ewald, devoted to the discussion and illustration of intestinal diseases; Herz's elaborate work on the various conditions and complications associated with digestive disease; the colossal work of Hemmeter on the diseases of the intestine, published but a few weeks ago. Why! the doctors of 1880 knew nothing of appendicitis, had never heard of intestinal dyspepsia, excessive intestinal fermentation, or of autotoxæmia—even knew not of colitis, far less of its several varieties. To revert to the metaphor of the Stock Exchange, twenty years ago stomachs were, bowels are, in favour; the operators who then influenced the stocks connected with the Bourse of Medicine conspired to bull gastric securities, the trusting medical investing public following their lead; now the leading operators in the Digestive Market have succeeded in developing a movement in favour of bowel scrip, leading to a boom in bowels and bowel interests, a slump in gastric interests.

This change in valuation, however, is by no means to be deplored. It signifies the onward progress of rational medical methods and opinions, from the long-cherished habit and custom of judging from signs and symptoms apparent exteriorly, and empirically allotted to some particular organ, toward search for, and recognition of, the primary cause of symptoms of disease, and treatment of the symptoms by removal of their source of origin.

ORIGINAL COMMUNICATIONS.

HOUR-GLASS STOMACH.

By B. G. A. Moynihan, M.S. (Lond.), F.R.C.S. (Eng.), *Assistant Surgeon, Leeds General Infirmary; Consulting Surgeon to the Skipton Hospital and to the Mirfield Memorial Hospital.*

(Plate X.)

Hour-glass stomach ("hour-glass contraction of the stomach," "bilocular stomach") results from narrowing of the stomach at any point between the cardiac and pyloric orifices. In the majority of examples, the isthmus connecting the two pouches is at or near the middle of the organ, but, owing to stasis of food, the cardiac complement becomes dilated, and is much larger, thicker, and more capacious than the pyloric.

It has generally been considered that the condition of hour-glass stomach is one of very infrequent occurrence. During the last few years, however, since surgeons have been called upon to deal with obstinate gastric affections more frequently than before, several examples have been recorded. Since August 1899, the date of my first operation for this condition, I have had under my care fourteen patients suffering from hour-glass stomach. In two of these the narrowing was due to malignant disease; in the remainder, to the contraction following simple ulceration.

Pathogeny.—Hour-glass stomach is usually described as being "congenital" and "acquired." Of these forms, the congenital is said to be the more frequent. Thus Fenwick in his work[1] writes: "In about 45 per cent. of the cases which have been recorded, neither ulcer nor scar could be detected in the stomach, while in the great majority of cases where an ulcer was present, it was obviously of more recent formation than the stricture"; and, again, "that the deformity is a rare result of ulceration, is proved by the fact that only one case of the kind is mentioned in the records of the London Hospital for forty years, whereas several instances of the congenital form of the disease were encountered during the same period of time."

Meckel considered that a congenital hour-glass stomach might result from an imperfection of development, and Cruveilhier and others have suggested that the sacculation is an instance of atavism, and that there is an analogy between such a deformity and the normal bifid stomach of certain rodents and the pouched stomachs of ruminants.

On examining specimens of hour-glass stomach, there can occasionally be seen two crossing bundles of muscular fibres on each surface of the organ. These were first noticed by Mariotti, but were more fully described by Saake. The bundles are generally half an inch or more in width, and cross at the point of narrowing in the stomach. Traced from the upper side of the cardiac complement, a bundle is seen to pass to the lower side of the pyloric, and from the lower side of the cardiac complement to the upper part of the pyloric, the fibres crossing like the widely opened blades of a pair of scissors. It has been suggested that these outstanding bands of muscle by their contraction determine the hour-glass form of the stomach, and their existence is held to be proof of the "congenital" origin of the deformity. In the only example I have seen of this muscular arrangement, the hour-glass stomach was clearly the result of an ulcer, whose edges were immensely thickened, and whose base had perforated. In this case the bundles of fibres followed the lines of puckering produced by the contraction of the ulcer, and were therefore clearly the result and not the cause of the deformity.

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[1] "Ulcer of the Stomach and Duodenum."

Cumston and other writers have said that in congenital hour-glass stomach the two pouches are connected by a tube or cylinder showing no scar of ulceration, and free externally from all adhesions. One such case I have dealt with by operation. I slit up the channel connecting the two sacs, and found a perfect example of "bridle" stricture, the result of healing in an ulcer, which, from the mucous surface, was easily seen and felt.

An example of congenital hour-glass stomach is said to have been recorded by Sandifort; the specimen was obtained from a fœtus. But the appearance of hour-glass deformity may be mimicked with remarkable accuracy by a condition of dilatation of the stomach and of the upper part of the duodenum, as the result of a congenital narrowing of the duodenum at or near the bile papilla. Such a case is recorded by Wyss.

In all the recorded examples of hour-glass stomach where a full examination of the viscus has been made, ulceration has been found. For those who believe that the deformity is congenital, the theory that the ulcer is secondary is sufficient. Thus Cumston writes: "These ulcers are secondary, and are probably produced by the pressure of the food passing through the strictured part of the organ."

Roger Williams in 1883 described ten examples of "congenital contraction of the stomach." The account of one of the cases is based on the examination of a wax model; of another, on the inspection of an "inflated dried" specimen; and of a third, on the appearance of a "dried stuffed" specimen. It is doubtful whether one of the examples can be accepted as an "hour-glass" stomach. In all the others, pathological conditions, ulceration, puckering, thickening, or adhesions were found.

Hochenegg, Carrington, Maier, Saake, and many other writers who describe their examples as "congenital," mention thickening, old ulceration, adhesion to the pancreas or to the abdominal wall, localised perforation, and other conditions which are indubitably the result of chronic ulcer of the stomach. Doyen, in his work on the diseases of the stomach and duodenum, refers to a case in which, at the isthmus of the stomach, an adhesion to the anterior abdominal was found; on breaking through this, a gastric fistula was exposed, showing unmistakably that an ulcer had been present, which had been prevented from perforating into the peritoneal cavity only by the anchoring of the organ to the anterior abdominal wall. This case is said to be "congenital."

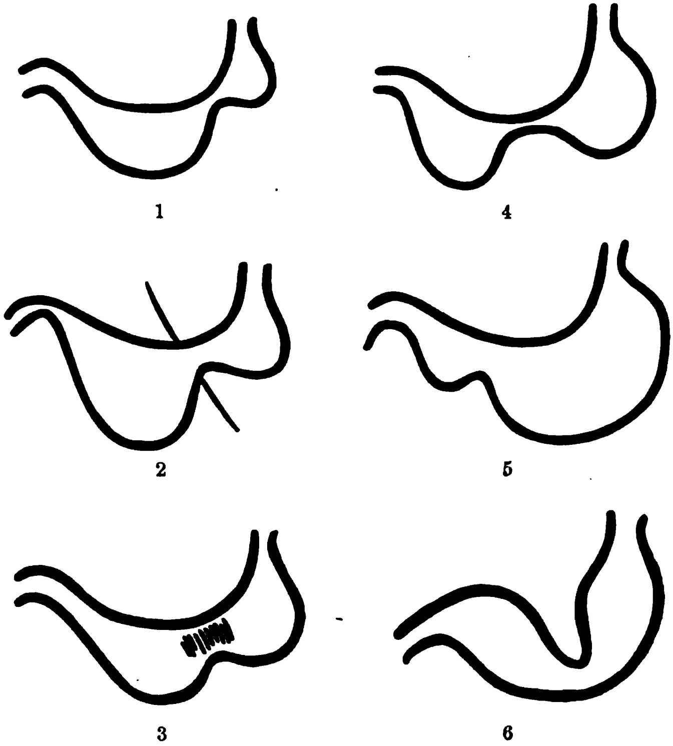

FIG. 1.—Types of Hour-glass Stomach.—1, Obstruction near cardiac end; 2, cardiac pouch concealed by adhesion; 3, growth causing constipation; 4, the two pouches connected by a tube; 5, cardiac pouch largely dilated; 6, lesser curvature pulled down towards the greater.

Mazotti relates a case of "congenital" hour-glass stomach in a woman of 50; he believed the deformity to be due to an unusual development of the transverse muscular fibres in a certain part of the wall of the viscus.

I have very carefully considered the question as to the existence of hour-glass stomach as a congenital deformity, examining all the specimens that I could find, and reading carefully the records of, I believe, all the published cases; but I remain confident in my belief that there is no evidence whatever which will establish the claim of those who assert that the disease is congenital in origin, and that it can exist apart from ulceration of the stomach.

There is, however, no improbability in the occurrence, if one considers the circumstances in cases of congenital stenosis of the pylorus. This point may be considered further in dealing with the origin of hour-glass stomach in the contraction following a simple ulcer.

ACQUIRED HOUR-GLASS STOMACH MAY BE CAUSED BY—(1) Perigastric adhesions; (2) ulcer, with local perforation and anchoring to the anterior abdominal wall; (3) chronic ulcer, generally at or near the middle of the organ; (4) malignant disease.

1. *Perigastric adhesions* may result from many causes—gastric ulcer, old tuberculous peritonitis, inflammatory affections of the gall bladder, and so forth. They were well marked in one of Mayo Robson's cases, in which a tough band caused the cardiac end of an hour-glass stomach to be divided into two sacs, thus forming a "trifid" stomach. They were well seen also in a case related by Cumston.

2. *Ulcer, with local perforation and anchoring of the stomach to the anterior abdominal wall.*—This was the condition I found in my first case. It results from the gradual deepening of a chronic ulcer. As the ulcer approaches the serous coat of the stomach, a few adhesions form, binding the viscus to the anterior abdominal wall, and preventing the bursting of the ulcer into the general peritoneal cavity. If the ulcer be on the posterior surface, a soldering to the pancreas may result, as in one case I have recently seen. When the stomach is anchored in its middle, the pouches on each side, but more especially on the cardiac side, show a tendency to sagging, and this, with the cicatricial contraction taking place in the ulcer, results in the hour-glass form of the stomach (Plate X. Fig. 2). In one of my cases, a malignant mass in the anterior wall had formed an extensive adhesion to the body wall. Doyen, Steffan, and Finney have recorded examples of this form.

In two recorded cases, an ulcer at the isthmus of an hour-glass stomach has perforated into the peritoneum and caused death. The first case was related by Siewers, the second by my friend Mr. W. H. Brown, who kindly asked me to undertake the examination of the specimen. The following was my report to him:—

"The specimen is a very beautiful example of hour-glass stomach (see Plate X. Fig. 1). The viscus is divided into two nearly equal cavities, communicating by an aperture which justs admits the little finger. On the serous surface is seen, opposite the point of narrowing, an oval orifice a quarter of an inch in diameter, with clean-cut edges, leading into the cavity of the stomach. There is some puckering of the surface, but no scarring. On the anterior surface were clearly seen, when the specimen was fresh, two crossing bundles of muscular fibres. The bundles are about two-thirds of an inch across, and run from the upper side of the cardiac complement to the lower side of the pyloric, and from the upper side of the pyloric to the lower side of the cardiac complement. The fibres in the bundles are most clearly distinguishable at the point of their crossing, becoming gradually lost as they apparently spread out. Similar bundles are seen on the posterior surface, though not so clearly. The same puckering is seen on the posterior as on the anterior surface.

"The stomach was slit open along the whole length of the greater curvature. The mucous membrane is seen to be gathered up into thick folds, radiating on each side to the constriction. There is no cicatrix visible on the mucous surface, but on gripping the wall of the viscus, between the isthmus and the lesser curvature, a massive thickening is perceptible, and on section this is found to be built up of dense cicatricial tissue around the ulcer which has perforated. The internal opening of the ulcer is oval in shape, and measures half an inch by one-third of an inch. The edges are thickened and undermined, but more deeply as they approach one another, so that the outer opening of the ulcer is only one-half the size of the inner. The ulcer's depth is not less than half an inch."

3. *Chronic ulcer.*—A chronic ulcer of the stomach is characterised by the thickening and induration at its base. In the healing of such an ulcer, especially if large in size or circular, a considerable amount of contraction will necessarily take place, and a high degree of narrowing of the stomach may result. There is, I believe, in addition to the cicatricial contraction, another factor of chief importance in determining the narrowing of the organ. I refer to *spasm.* On several occasions during the last twelve months, when operating for chronic ulcer, I have watched the stomach intently for several minutes, and have seen the onset, the acme, and the gradual relaxation of a spasmodic muscular contraction in its walls. Quite gradually the stomach narrows, the wall becomes thicker, and almost white in colour; when taken between the fingers, the contracted area feels like a solid tumour. The spasm may be so marked as to prevent a finger being invaginated through the segment affected. The appearance presented is very striking. I have seen it in the body of the stomach and at the pylorus. As slowly as it comes on, the spasm quietly relaxes, and the stomach assumes its usual form. In one patient I watched four such spasmodic seizures at the pylorus in a few minutes, and the tumour formed by the tightly contracted muscle was so large, that in a very thin subject it should have been readily felt on palpation of the abdomen. Such constantly recurring attacks of spasm must lead to an hypertrophy of the circular muscular fibres, and this thickening, together with the cicatricial

contraction and the induration of the ulcer, will amply account for the extreme narrowing of the stomach cavity, with the dense thickening of the walls met with in many of the examples recorded.

The condition of congenital stenosis of the pylorus was described by Thomson under the name "congenital gastric spasm." The condition found in this disease resembles very closely that which I have seen in the adult stomach, contracting vigorously in the manner described. Indeed, I have thought that the congenital stenosis may be the result of a spasm set up by some ulceration in the stomach or the first part of the duodenum. That ulceration in both the stomach and duodenum may be present immediately after birth, is attested by many writers, and verified by many specimens; but, so far as I am aware, no ulceration has been found in cases of congenital stenosis. The difficulty of finding an ulcer in the stomach of an adult, even when the ulcer has been the cause of death from hæmatemesis or melæna, or both, is often considerable, and at times insuperable, and it may well be possible to overlook a trivial ulceration in the stomach of an infant. The spasm, when long continued, may result in a fibrous transformation of the muscle, and subsequent cicatricial contraction.

The extent to which spasmodic contraction, invoked by ulceration, is responsible for the narrowing found in hour-glass stomach (and congenital stenosis), is not capable of being measured; but my observation of the cases I have seen during the last twelve months makes me ready to believe that it is not inconsiderable.

Klein has recorded one example of hour-glass stomach, resulting from the contraction of an ulcer which had been caused by the drinking of hydrochloric acid, with suicidal intent. Syphilis of the stomach may result in ulcer or gumma, and consecutive warping of the viscus.

The amount of induration found round a chronic ulcer may be so considerable, and its density so marked, that a mistaken diagnosis of malignant disease of the stomach may be made. This happened in Case 11 in my list. A large, densely hard, immovable mass, adherent to the pancreas, was found in the stomach walls between the two loculi. The appearance of malignant disease was accurately simulated. I could not remove the mass, and could not reach the cardiac pouch with sufficient ease to allow me to perform a gastro-enterostomy, and I was therefore only able to dilate the constriction between the two pouches. After considerable pressure, I was able to invaginate my little finger through the isthmus, and slowly to dilate until three fingers would pass through. I hoped by so doing to lessen the distress of the vomiting, which had been almost continuous. The patient speedily recovered, and now, ten months later, is perfectly well; she has gained 2½ stones in weight, is ruddy and healthy in appearance, and the tumour, readily palpable before the operation, has entirely disappeared.

One point, which is, I believe, deserving of especial emphasis, is the frequency with which, in cases of hour-glass stomach due to chronic ulcer, a narrowing of the pylorus is also found. The constriction in the middle of the stomach hinders the passage of food from the cardiac to the pyloric pouch; the narrowing at the pylorus makes difficult the emptying of the pyloric sac, which, in consequence, undergoes dilatation. This double constriction is an illustration of a fact I have repeatedly verified in operations upon the stomach—the frequency of multiple ulcers in the stomach, or in the duodenum, or in both. If the cardiac loculus alone is obstructed, the pylorus being free, the walls of the former are much thicker than those of the latter. Lunnemann, in such a case, found the circular muscular fibres 2 to 2·5 mm. thick on the cardiac side, and only 1 to 1·5 mm. on the pyloric. It is possible that the contraction found at the pylorus may be the result of a long-continued spasm, set up by the ulcer whose healing has caused the hour-glass shape of the stomach. Frequent spasm would cause hypertrophy of the muscular coats, and fibrous transformation would occur in the over-developed muscle.

Cancer.—Cancer as a cause of hour-glass stomach is not infrequent. Three specimens of this kind are in the Museum of the R. C. S. in London. I have operated upon two cases. In the first, the malignant disease, beginning rather nearer the cardiac than the pyloric end of the stomach, had infiltrated the greater part of the organ, and had resulted in a condition of "leather bottle" stomach. In the second, a large chronic ulcer, with carcinoma implanted upon it, "ulcus carcinomatosum," was found.

SYMPTOMS OF HOUR-GLASS STOMACH.—An hour-glass stomach can be diagnosed with certainty, if attention be paid to a certain combination of symptoms. In my first six cases only one was diagnosed; in my last eight cases, six were diagnosed with certainty; in one of these the diagnosis was made by the medical attendant, Dr. M'Gregor Young, before I was asked by him to see the patient. The symptoms will naturally vary according to the position of the constriction in the stomach: if this lies near the cardiac orifice, the clinical picture will resemble that given by œsophageal obstruction low down; if near the pyloric orifice, the symptoms are those of dilated stomach. But, wherever the narrowing may be, attention to the following signs will, in almost every case, enable a diagnosis to be made with confidence.

1. If the stomach tube be passed, and the stomach washed out with a known quantity of fluid, the loss of a certain quantity will be observed when the return fluid is measured. Thus, if 30 oz. be used, only 24 can be made to return, as in Dr. M'Gregor Young's case already mentioned. Wölfler, who called attention to this sign, said that some of the fluid seemed to disappear "as though it had flowed through a large hole"—as indeed it has, in passing from the cardiac to the pyloric pouch (Wölfler's "first sign").

2. If the stomach be washed out until the fluid returns clear, a sudden rush of foul evil-smelling fluid may occur; or, if the stomach be washed clean, the tube withdrawn and passed again, in a few minutes several ounces of dirty, offensive fluid may escape. The fluid has regurgitated through the connecting channel between the pyloric and cardiac pouches (Wölfler's "second sign").

3. *Paradoxical dilatation.*—If the stomach be palpated and a succussion splash obtained, the stomach tube passed, and the stomach apparently emptied, palpation will still elicit a distinct splashing sound. This is due to the fact that only the cardiac pouch is drained; the contents of the pyloric remain undisturbed, and cause the splashing sound on palpation. For this phenomenon, Jaworski has suggested the appropriate name, "paradoxical dilatation." Jaboulay has pointed out that if the cardiac loculus be filled with water, a splashing sound can still be obtained by palpation over the pyloric pouch.

4. Von Eiselsberg observed in one of his cases, that on distending the stomach a bulging of the left side of the epigastrium was produced; after a few moments this gradually subsided, and concomitantly there was a gradual filling up and bulging of the right side.

5. Von Eiselsberg also called attention to the bubbling, forcing sound which can be heard when the stethoscope is applied over the stomach, after distension with CO_2. If the two halves of a seidlitz powder are separately given, and the stomach be normal or dilated, no loud sound is heard; if a constriction is present in the stomach, a loud, forcible, gushing sound can be easily distinguished.

6. I first called attention, a year ago, to a sign which I have since found of great service in establishing a diagnosis of hourglass stomach. The abdomen is carefully examined, and the stomach resonance percussed. A seidlitz powder in two halves is then administered. On percussing, after about thirty seconds, an enormous increase in the resonance of the upper part of the stomach can be found, while the lower part remains unaltered. If the pyloric pouch can be felt, or seen to be clearly demarcated, the diagnosis is inevitable, for the increase in resonance must be in a distended cardiac segment. If the abdomen be watched for a few minutes, the pyloric pouch may sometimes be seen gradually to fill and become prominent.

7. Schmidt-Monard and Eichhorst have both seen a distinct sulcus between the two pouches, inflated with CO_2. In Case 11 in my list, the two pouches with a hard, as I thought, malignant, mass between them, could be readily seen. When both pouches were distended with CO_2, alternate pressure upon them showed unmistakably that they communicated through a very narrow orifice, for the one could be emptied slowly into the other. The

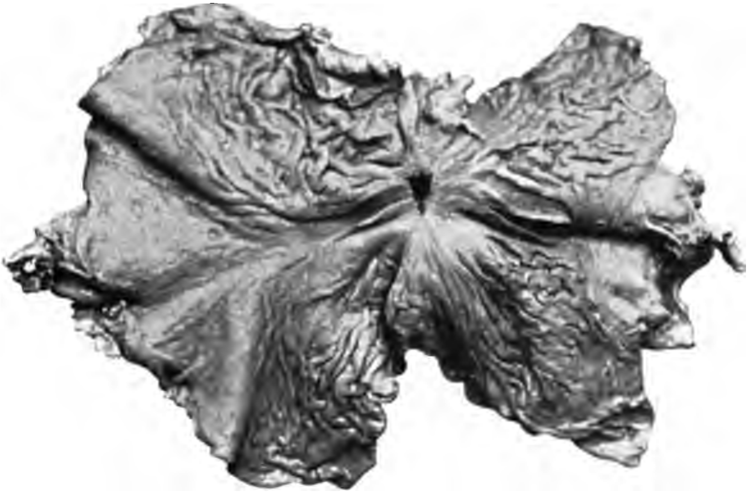

FIG. 1.—Hour-glass Stomach showing perforating Ulcer.

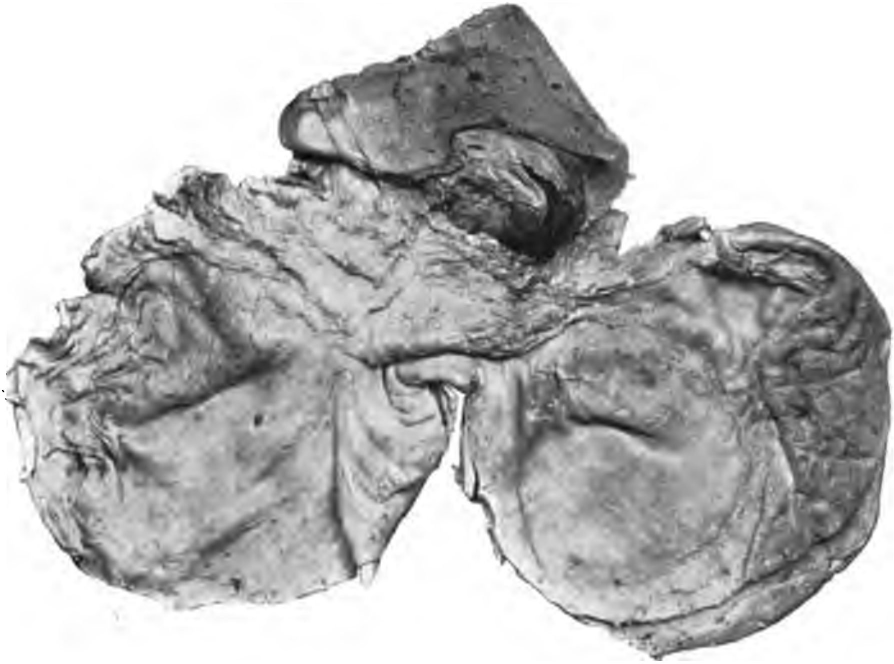

FIG. 2.—Specimen of Hour-glass Stomach.

diagnosis in such a case is simplicity itself. In Case 8 a distinct notch was seen at the lower border of the inflated stomach.

The two aids to diagnosis of greatest value are, it will be seen, the washing out of the stomach and its inflation with gas by the administration of a seidlitz powder in two portions. The fluid used for the washing must be carefully measured before use; the tube is then passed, and the stomach emptied, the contents set aside in a separate dish, and the washing commenced. All the fluid now returning is collected in a separate vessel and carefully measured.

The inflation of the stomach is best effected by the giving of a seidlitz powder, the two packets separately, at an interval of about half a minute. If the patient bears the stomach tube well, a Higginson syringe may be fitted on to its outer end after removal of the funnel, and air pumped into the stomach. In practice, I do not find this as convenient as the seidlitz powder, as the air can be belched up through the tube very easily. There is no discomfort caused by the inflation of the stomach, and no danger. Unless a hæmorrhage has recently occurred, I invariably distend the stomach with CO_2 in all gastric cases sent to me for treatment, and I have never observed even the most trivial discomfort arising therefrom.

DIFFERENTIAL DIAGNOSIS.—The two conditions for which an hour-glass stomach is liable to be mistaken are œsophageal obstruction, low down, and pyloric stenosis. If the constriction in the stomach is within an inch or two of the cardiac orifice, the upper loculus of the stomach will be very small in size, and capable, therefore, of holding only small quantities of food. Food, when swallowed, may be regurgitated within a few minutes almost unaltered, and the patient may tell the same story of difficulty in "getting the food down" as is told by one whose œsophagus is obstructed. A correct diagnosis can be made by introducing the œsophageal bougie; if the bougie passes over 15 in. from the teeth, the obstruction does not lie in the stomach.

If the constriction be near the pylorus, the cardiac complement will be dilated, and will present the same appearances and signs as a dilated stomach. Wölfler's two signs (1 and 2 in the list given) will generally enable a correct diagnosis to be achieved.

If the obstruction should lie at any point between the two mentioned, there should be no difficulty in making a correct diagnosis.

TREATMENT.—The treatment of hour-glass stomach may be beset with difficulties. If the stricture is near the cardia, or if the cardiac complement be bound up in adhesions, there may be great mechanical hindrance to the performance of any operation. When the abdomen is opened, a thorough examination of the whole stomach must first be made. The dilated pyloric sac may so completely resemble the whole stomach as to lead to the performance of a gastro-enterostomy between it and a loop of jejunum. Several cases are recorded in which this mistake has been made, and it is therefore necessary to emphasise the importance of an examination of the whole stomach up to the cardiac orifice in every case, no matter how obvious the diagnosis of "dilated stomach" may have seemed.

In many cases of hour-glass stomach, no single operation will suffice to relieve the symptoms. This is due to the fact, already mentioned, that where a stricture is present in the body of the stomach, a second stricture at the pylorus is also found. When the pyloric complement is dilated, a stenosis of the pylorus, or in the first portion of the duodenum, is certainly present. This dual stenosis, which has not received adequate attention from any writer, accounts for the lack of permanent improvement seen in

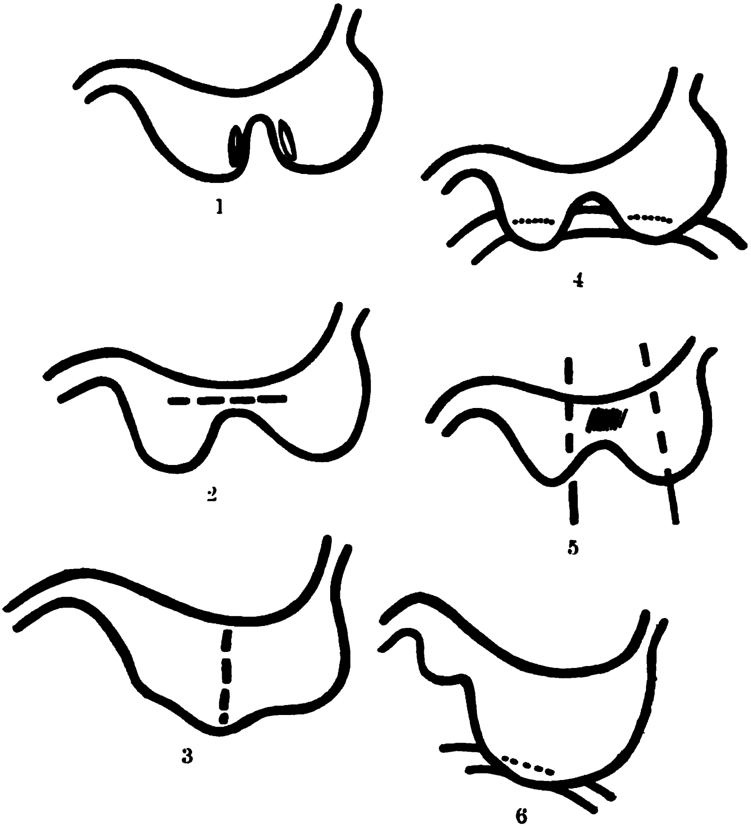

FIG. 2.—Diagram showing the operations for hour-glass stomach. 1, Gastro-gastrostomy; 2 and 3, gastroplasty; 4, double gastro-enterostomy; 5, partial gastrectomy; 6, posterior gastro-enterostomy.

many of the cases. If in such circumstances a gastro-enterostomy is performed between the cardiac pouch and the jejunum, the pyloric pouch becomes a reservoir, incapable of efficient emptying, wherein food lodges and becomes sour and putrid. If a gastroplasty is performed, the stomach cannot empty itself because of the pyloric stenosis, and the symptoms are unrelieved. Such a condition can only be adequately dealt with by the performance of two operations,—at the same time, gastroplasty and pyloroplasty, gastroplasty and gastro-enterostomy from the pyloric pouch, or a double gastro-enterostomy, a loop of jejunum being opened at two points, at the upper into the cardiac pouch, at the lower into the pyloric.

In operating upon hour-glass stomachs, I have noticed, on three or four occasions, that the pyloric pouch was partially filled with a dirty-looking and slightly offensive fluid. In washing out the stomach before operation, it is obvious that when the stricture is narrow the cardiac pouch only is cleansed. In the pyloric pouch food remains stagnant for lengthy periods, and may become foul, putrid, evil-smelling. Before opening the pyloric sac, for the purposes of anastomosis, it may be necessary to empty it of its contents through a needle, to which is attached a long tube, or to wash it out through a rubber tube introduced at the point of the future anastomosis.

The following are the operations that may be practised (see Fig. 3):—

(1) Gastroplasty. (2) Gastro-gastrostomy, or gastro-anastomosis. (3) Gastro-enterostomy. (4) Partial gastrectomy. Pyloroplasty or gastrolysis may also have to be performed in addition to any of the foregoing.

The operation selected will necessarily depend upon the conditions found. If the two pouches sag downwards and almost touch below the isthmus, a gastro-gastrostomy may be performed, as in Cases 4 and 14 (in this case followed by gastro-enterostomy) in my list. If the pyloric pouch be small, and the cardiac large, a gastro-enterostomy from the latter, as in Cases 7, 8, 9, and 10.

If a narrow isthmus be found, without thickening or adhesions, a gastroplasty, as in Case 5.

If an ulcer adherent to the abdominal wall be found, and on separating this a fistula be disclosed, the thickened edges of the ulcer may be excised and gastroplasty performed, as in Case 1.

If a malignant growth forms the waist of the stomach, a partial gastrectomy, as in Case 12. If the growth is too extensive for removal, and the stomach has no healthy wall allowing of an anastomosis, the palliative operation of jejunostomy may be needed, as in Case 6.

If both pouches need draining, a double gastro-enterostomy may be performed, or a gastroplasty followed by gastro-enterostomy.

[*Continued on page* 530.

Personal Cases dealt with by Operation.

No.	Date.	Sex.	Age.	Symptoms and Description.	Condition Found; Operation.	Result.	Remarks.
	August 1899.	F.	39	Ten years ago the patient had an illness characterised by profound anæmia. Seven months ago there were clear symptoms of ulcer of the stomach, but neither then nor at any time any acute illness suggestive of perforation. Now, vomited after all ordinary food, and more often than not even after small quantities of fluid food. Pain after food was exceedingly severe. On examination of abdomen, a dilated stomach could be felt. At one point, a little to the left of the middle line and slightly below the ensiform cartilage, was an area 2 in. in diameter, which was markedly tender and offered increased resistance on palpation. This area was found at the operation to correspond precisely with the area of stomach adhesion. The patient had lost weight, and deteriorated seriously in general health during the last few months.	Hour-glass stomach, the narrow constriction being near the middle of the stomach and adherent to the anterior abdominal wall over an area equal to a crown-piece. On each side of this, the stomach dilated and seemed to be anchored by the adhesion. On separating the stomach from the abdominal wall, an opening into the viscus was exposed, and the stomach contents escaped. This opening was enlarged transversely, and the wound and fistula were stitched up vertically. An omental graft was brought to cover in the sutured area in order to guard against future anchoring.	Recovery.	For a month after the operation there were pain at times and loss of appetite. Since then she has been free from pain and in excellent health. Appetite and digestion are good. Patient seen with Mr. Bailey, Horsforth. In Feb. 1902 condition was still perfectly satisfactory.
2	April 1900.	F.	27	There was no history of gastric ulcer. The patient had complained of irregular attacks of pain in the epigastric region for eleven months, always associated with the taking of food, and coming on about one hour after a meal. Vomiting was occasional and irregular, in rather large quantities; there was no blood. On examination, the stomach was distended and splashy; contractions were seen when distended. Medical treatment had proved unavailing.	Hour-glass stomach. The constriction was about 4 in. from the pylorus; the passage between the two sacs equalled a No. 12 catheter in diameter. There were marked induration and puckering, but no adhesion to the abdominal wall or elsewhere. The strictured neck was divided by an incision about 2½ in. long in the transverse direction, and stitched up vertically, the mucous membrane with a continuous catgut suture, and the serous with a continuous silk suture. Two additional interrupted sutures were applied at each end of the wound.	.	Vomiting for five days after the operation, blood-stained. Since then perfectly well. Patient seen with Dr. Waugh, Skipton. In March 1902 reported to be in complete health.

3	Jan. 24, 1901. Hospital; Registered No., 443.	M.	45	Ailing for three years. Pain in the epigastrium radiating to the left chest. Was worse after food, coming on "within half an hour," and lasting for from two to four hours, unless relieved by vomiting. Frequently vomited about an hour after food; never any blood. Lately the pain had been almost constant, aggravated by food, and eased by vomiting. Had lost 2 st. 12 lb. Dilated stomach. On distending with CO_2, a notch was noticed at the upper border of the stomach, and a tentative diagnosis of hour-glass stomach was made. Free HCl. A trace of lactic acid and a few rod-shaped bacilli.	An hour-glass stomach. The scar of the ulcer was equal in size to a florin, was situated close to the lesser curvature, and nearer the cardiac orifice than the pyloric. There were much puckering and induration of the surface. There were no adhesions. The index finger entered, but could not pass the stricture. An incision 3¼ in. long was made transversely, and stitched longitudinally in two layers. A slender adhesion of gall bladder to the pylorus was divided. (Gastroplasty, gastrolysis.)	Recovery; before leaving hospital, the ordinary diet without any discomfort.	Weight before operation was 7 st. 6 lb.; has gained 1 st. 8¼ lb. Patient was seen with Dr. Trevor Pritchard, Retford. In March 1902 reported to be quite well.
4	Mar. 6, 1901. Infirmary; Registered No., 1221.	F.	28	Symptoms of gastric ulcer for more than five years. Was under treatment at beginning of illness at the Infirmary. Had been gradually getting worse. Vomited now after every meal; pain and vomiting came on about from half an hour to one hour after food. Vomit was very "sour." On examination, hour-glass stomach. On distending with CO_2, the cardiac half increased considerably, forming a very large lymphatic area. The pyloric half distended but little; the division was clearly seen. On auscultation, a forcing, gurgling sound was distinctly heard.	Hour-glass stomach. The cardiac side of constriction was much dilated, and larger than a normal stomach. Rather beyond the middle of the organ was a constriction that would just admit the forefinger; round constriction were much induration and many adhesions; especially noticeable was one thick cord-like one coming from the liver. This was divided between ligatures. The liver was slightly torn on separating widespread adhesions along the lesser curvature. Below it on each side the stomach sagged, and between the cavities an anastomosis was made which readily admitted three fingers. (Gastro-gastrostomy, gastrolysis.)	Recovery.	March 1902. — Perfect result. Eats well and heartily, and has no discomfort. Patient seen with Dr. Waugh, Skipton.
5	Mar. 9, 1901. Infirmary; Registered No., 1237.	M.	55	Stomach troubles for sixteen years. At first pain after food and occasional vomiting. Five years ago an acute attack of hæmatemesis, melæna, and general swelling of the body, which it was feared might prove fatal (? perforation). No ease in the stomach since then; constant vomiting, pain after every meal, and great wasting. Now looked thin, pinched, and shrivelled. For three weeks had had no food, only sips of water and	Hour-glass stomach. At first it was thought to be a dilated stomach. On tracing the stomach towards the pylorus, an extremely narrowed isthmus (barely as thick as the little finger) was come to which was supposed to be narrowed pylorus, but on tracing beyond it stomach was still found. On invaginating a finger from each side of constriction, no opening could be felt. Many adhesions were separated until all was clear and	"	This patient was in the Infirmary under Mr. Littlewood, and was operated upon by me in his absence.

No	Date.	Sex.	Age.	Symptoms and Description.	Condition Found; Operation.	Result.	Remarks.
5	Mar. 9, 1901. Infirmary; Registered No., 1237—*contd.*	..	..	nutrient enemata. On examination, dilated stomach. Free HCl.	free. Then incision into the stomach or cardiac side of the isthmus, and a probe-director was passed through constriction, which it fitted snugly, the opening being no bigger than a No. 4 or No. 5 catheter. Gastroplasty was performed. On the pyloric side of the stricture was a column of mucous membrane forming a bridle stricture. This was ligatured, divided at both ends, and removed.	..	..
	Mar. 3, 1901.	M.	54	Vomiting of fluid if taken in quantities exceeding an ounce (see text).	Hour-glass stomach. Narrowing close to cardia due to malignant disease which had invaded the stomach everywhere. (Jejunostomy.)	Recovery.	Patient seen with Dr. Sykes, Cleckheaton. Died April 9.
7	April 1901. Registered No., 1709.	M.	46	Symptoms for twelve months; pain, heaviness, discomfort after meals; loss of weight and general deterioration in health. At Christmas had an attack of acute pain and hæmatemesis, and was very ill for several days; since then has never taken any food (solid or liquid) without pain. Has noticed on several occasions that the stools were "black as ink." Vomits now every day.	Two ulcers near the pylorus, one on gastric, one on duodenal side. A mass equal in size to a walnut found at the pylorus. Pylorus very narrow; adherent to liver and gall bladder by dense bands. At the middle of a hugely dilated stomach a constriction that would admit four fingers. Posterior gastro-enterostomy to pyloric pouch. At the post-mortem two ulcers (duodenal and gastric) were found, the former very adherent to the gall bladder; the latter had perforated into a mass of adhesions, its base being partly formed by the pancreas.	Death.	Sent by Dr. Crawford Watson, Harrogate. All went well for three days; then a large prolapse of rectum (from which he had previously suffered) came down during the night, and was not discovered for four hours. When I saw him, the prolapse was livid and œdematous, and could not be reduced until ether had been administered. From this time patient became gradually worse; the temperature ran up to 104° and 105°, and he died four days later. The following is an abstract from the post-mortem record, written by Dr. Maxwell, Telling: — "The stitches are quite sound, the opening good, and surgical technique perfect. No peritonitis. The hæmorrhoidal and inferior mesenteric veins are full of disintegrating clot. (Septicæmia.)"

8	May 24, 1901. Registered No., 2413.	M.	48	For many years has vomited after food. Pain comes on about one and a half hours after food, and is eased by vomiting. In Nov. 1899 and May 1900 had severe hæmatemesis. Three years ago was in the infirmary, and a diagnosis of "cancer" was made. On examination, an irregular dilated stomach. On inflation, a distinct notch seen in the lower border; just above this a very loud, forcing, gushing sound heard. Hour-glass stomach diagnosed.	Hour-glass stomach. The cardiac pouch much dilated, pyloric small and not dilated. The constriction was about 3 in. from the pylorus. At the upper border of the isthmus a hard mass, equal to a walnut in size, with puckering of stomach and lesser omentum. (Posterior gastro-enterostomy.)	Recovery.	Sent by Dr. Isaac Taylor. Weight before operation, 8 st. 2 lb. Weight, Jan. 15, 1902, 10 st.
9	May 1901 ..	F.	50	Ailing many years, the symptoms dating from an illness in which "gastric ulcer" was diagnosed. A diagnosis of "hour-glass stomach" was made by Dr. M'Gregor Young.	Hour-glass stomach; the isthmus being about 2¼ in. from the pylorus. The stomach and all the intestines were thin and translucent, and seemed almost devoid of muscle. On exposing the posterior wall of the cardiac pouch, a second ulcer was seen. Posterior gastro-enterostomy was performed. After the operation, regurgitant vomiting of such severity and persistence that a second operation was undertaken, and the proximal and distal segments of the jejunal loop were united. (Jejuno-jejunostomy.)	"	Patient seen with Dr. M'Gregor Young. The result of the operations has been most satisfactory; the patient is much better than she has been for many years.
10	June 1901.	M.	39.	Stomach troubles for nine or ten years. Then began quite suddenly to have great pain after food and to vomit two or three times a day; no hæmatemesis. The pain usually came on about one and a half hour after food. Seen four years ago by a consulting physician, who diagnosed dilated stomach, and advised lavage, which has been done ever since. Relief at first very great, but lately a serious relapse and no relief from washing. Hour-glass stomach diagnosed.	Hour-glass stomach. The constriction just admitted the end of the forefinger, was situated about 3 in. from the pylorus, at a point where loud gushing sounds were heard before operation. The cardiac complement was enormous, the pyloric a little dilated. (Posterior gastro-enterostomy. Pylorodiosis.)	Death.	Sent by Dr. Ellis of Halifax. After the operation patient had suppression of urine. In four days secreted only 11½ oz., tinged with blood. Pulse became very rapid and of poor volume. Five pints of saline solution infused. Urine was secreted almost at once. Gradual improvement then for nine days; then suppression for forty-eight hours, and death. Both kidneys diseased, the left small and granular and cirrhotic, the right granular. Operation area normal. The urine before operation had been frequently examined and nothing abnormal discovered.

No.	Date.	Sex.	Age.	Symptoms and Description.	Condition Found ; Operation.	Result.	Remarks.
11	June 1901.	F.	25.	For three years has suffered from vomiting, pain after food, inability to take ordinary diet. Has never vomited blood, but has seen vomit which "resembled tea." Vomiting now almost continuous. Has lost 3 stone in weight. On examination a hard mass above and to the left of the umbilicus. On distending the stomach with CO_2 a distinct swelling on each side of tumour. Hour-glass stomach clearly seen.	Hour-glass stomach. A large mass, about 4 in. diameter, found at the function of the two pouches, densely hard, immovable and adherent firmly to pancreas. Several enlarged glands. Supposed to be malignant. Stricture between the two pouches dilated freely.	Recovery.	Sent by Dr. Crawford-Watson, Harrogate. Weight before operation, 5 st. Vomiting ceased at once, and food was freely, almost greedily, taken. The tumour quickly disappeared. Looks ruddy and well. Weight now, 7 st. 7 lb.
12	July "	F.	38.	At the age of 17 had a gastric ulcer; vomiting and hæmatemesis for several weeks. Since then has always had gastric uneasiness. Ten years ago "an ulcer burst," after a long walk. She suddenly experienced acute pain in epigastrium, and fainted; during the subsequent night she vomited a "chamber-utensil-ful" of blood, and later "coffee-grounds" material. Since this attack has never enjoyed a hearty meal. For last few months has lost flesh rapidly; for the last three weeks she has been in bed, and has not been able to take anything but milk and water, and has returned most of that. Gastric tetany in limbs.	Hour-glass stomach, nearer the cardiac than the pyloric end. The stomach was adherent over an area about 2½ in. in diameter to the anterior abdominal wall and liver. On detaching, the stomach was opened. The opening was about 1¼ in. in diameter, the edges over half an inch thick, and the mucous membrane greatly thickened and pouting. At the point of adhesion the stomach was markedly narrowed. The ulcer and a surrounding mass of stomach was excised, and gastroplasty performed. Pylorus would only admit the passage of a director, and pyloroplasty was therefore performed.	Death.	Sent by Dr. Cheetham, Guiseley. Patient seemed to be going on well until the fourth day, when the pulse rapidly failed. The examination of the excised mass showed malignant disease to be present.
13	...	M.	40.	About six months ago was suddenly seized with acute, intolerable pain in upper part of abdomen. Constant stomach troubles since; pain, weight, "dragging sensations." Has lost flesh quickly. On examination, a smooth globular swelling between mid-line above umbilicus and left costal margin. Soft and fluctuating.	The stomach was hour-glass shaped; the constriction was adherent to the anterior abdominal wall. On separating the adhesion, the stomach was opened and gastroplasty was performed. The tumour pushed the stomach forward. The great omentum below stomach was torn through, and the finger passed into the lesser sac. A smooth globular cyst found projecting into the cavity and springing from the pancreas.	Recovery.	Sent by Dr. J. Exley, Wortley. A pancreatic fistula remained until to-day, but is almost closed. Health and weight fully regained.

14	...	F.	28.	Six years' history of increasing indigestion, dating from an illness described by the doctor as "ulcerated stomach." Pain comes on one hour after food, worse when lying on the right side. Vomits after nearly every meal. Is getting steadily thinner. Wölfler's two signs, paradoxical dilatation, and, on inflation, both pouches are seen.	Hour-glass stomach and very tight pyloric obstruction. I performed gastroplasty and posterior gastro-enterostomy into the distal pouch.	Death.	Sent by Dr. Baxter-Tyrie of Keighley. Death from pneumonia on the fifth day. The anæsthetic was badly taken, lividity and rigidity of abdominal muscles being present throughout.

Gastroplasty was first performed by Bardeleben in 1889, later by Kruckenberg, Doyen, and others.

Gastro-gastrostomy was first performed by Wölfler in 1894. In 1895, Sedgwick Watson performed a gastro-anastomosis by folding the pyloric over the cardiac pouch, with the constriction as a hinge, and uniting the apposed surface.

A reference to my list of cases will show that in twelve the disease was simple; in two, malignant. Of the twelve due to simple ulceration, three died, one from septicæmia, the result of a large rectal prolapse, which became inflamed and caused bogginess in the whole perineum, and septic thrombosis of the inferior mesenteric vein, one from pneumonia, and one on the fourteenth day from a second attack of suppression of urine.

Of the two malignant cases, one died on the fourth day, showing rapid failure and extreme rapidity of the pulse, and one rallied from the operation, though desperately ill, and survived.

WHAT IS PURE CHLOROFORM?

By THOMAS D. LUKE, M.B., M.R.C.S. Ed., *Anæsthetist, Deaconess Hospital, Edinburgh.*

CHLOROFORM, or trichloro-methane, $CHCl_3$, is prepared commercially by distilling a mixture of spirit, chlorinated lime, and slaked lime. The alcohol is primarily oxidised to ethyl-aldehyde; this attracts chlorine from the bleaching powder, and forms chloral, which completes the process by entering into relation with $Ca(O.H)_2$, and splitting up into calcium formate and chloroform. The chloroform is separated by distillation from the mother liquid, and thus the impurities which are met with in it are almost entirely volatile impurities.[1]

They are:—Free chlorine; HCl, a trace (Ramsay); acetic acid; formic acid; aldehyde; methyl compounds; allyl-chlorine; ethylene-dichloride.

By subsequent decomposition carbonyl-chloride may be added, and probably of all possible impurities it is the worst.

The object of this article is to deal more especially with the *alcohol* factor in the chloroform. This may be pure ethyl-alcohol, which has never been anything but pure ethyl-alcohol, $C.2H_5(O.H)$,[2] or it may be methyl-alcohol, so dealt with and purified, either before or after the process of chloroform-making begins; it is to all intents and purposes ethyl-alcohol, and freed from methylic impurity. As is generally known, methylated spirit is simply ethylic alcohol, to which 10 per cent. of naphtha or wood spirit has been added to make it nauseous and unsuitable for dietetic purposes. By special arrangement with the Customs, a modified and pure form of wood spirit is used for this purpose. It is illegal to rectify the methylated spirit before starting the preparation of the $CHCl_3$, but it is quite easy to purify and rectify it during the making of the $CHCl_3$.

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[1] Pictet separated the impurities by freezing out the chloroform.

[2] Chloroform is now largely prepared, also, from acetone, by the dry distillation of sodium or calcium acetate. This source was first used commercially in 1880.

Now, unfortunately, it has been customary to call chloroform so prepared "methylated" chloroform. The term is misleading. It is also applied to ether so prepared, and it is equally absurd to call this ether "methylated." If it has been properly purified, it is in no sense "methylated" ether; both chloroform and ether, properly so prepared, are free from all trace of methyl compounds; and by all chemical tests known at the present day, by taste and by smell, the ether and the chloroform are quite indistinguishable from "chloroform prepared from pure ethylic alcohol," or "ether," as the case may be.

We have as little cause for presuming that chloroform prepared from methylated spirit contains methyl-alcohol, as we have to suppose that so-called "sulphuric" ether contains sulphuric acid.

One may well ask how such an anomaly exists, and how it came to exist? Chloroform was first prepared from methylated spirit about 1855. Now, apparently, "the law" looks upon "methylated" chloroform as an external application, because the bulk of it is used in the preparation of liniments and embrocations, but also for inhalation; and the law appears to ignore the fact that when so used it very rapidly becomes an internal application. The Revenue does not appear to concern itself very much about alcoholic B.P. preparations, unless they are drunk, *e.g.*, tinctures.

It may be taken for granted, without subjecting any specimen of chloroform to a rigid chemical analysis, that if it is produced by a reputable firm of chemists and carefully stored, that it is free, for all practical purposes, from the impurities before mentioned, and fit in all respects for routine exhibition to the human species for purposes of anæsthesia.

In regard to the storing of chloroform, Mr. D. Brown says: "Chloroform is not the delicate article some people imagine, but may be exposed to sunlight for some weeks without undergoing decomposition." He finds that 1 per cent., or less, of added alcohol will keep chloroform almost indefinitely, even though moderately exposed to daylight, and in this view he is confirmed by J. Reynauld. I know a firm of chemists which at the present time has in its warehouse some chloroform prepared at the time of the Russian War, and it is in every way suitable for present day use.

Professor Ramsay has stated that chloroform kept over a small quantity of slaked lime, and decanted before use, keeps better than by itself. Mr. D. Brown has controverted this view, and, on the contrary, asserts that contact with lime causes a rapid decomposition of chloroform.[1]

To conform, however, to the specifications of the British Pharmacopœia, chloroform has to stand the following tests:—

1. On allowing 20 c.c. to evaporate from a large piece of filter paper, placed on a warm plate, no foreign odour is noticeable at any stage of the evaporation.

2. The absence of acid is ascertained by shaking chloroform with twice its volume of water for five minutes, when the water, being separated—(*a*) should not afford any colour with 1 c.c. of cadmium iodide, and two drops of starch mucilage; (*b*) should not yield more than a very slight opalescence with 4 drops of $AGNO_3$ (absence of chlorides); (*c*) should be neutral to litmus paper.

3. After shaking H_2SO_4 with chloroform ten times its bulk for twenty minutes, and setting aside for a quarter of an hour, both acid and chloroform should be perfectly transparent and nearly colourless. (*a*) Two c.c. taken from the H_2SO_4 layer and diluted with 5 c.c. of water should remain transparent and very nearly colourless, and should have a pleasant odour. (*b*) If this liquid be further diluted with 10 c.c. of water, and stirred with a glass rod, it should be transparent and colourless, and the addition of 4 drops of solution of $AGNO_3$ should only cause a slightly diminished transparency.

4. Water which has been shaken with half its volume of chloroform—previously treated with H_2SO_4, as described above—should not afford more than a slightly diminished transparency with solution of silver nitrate.

These tests indicate the absence from chloroform of any products of its decomposition.

To all these tests will freshly prepared or properly stored methylated chloroform answer; indeed, most manufacturers guarantee it to do so. And, further, methylated chloroform is in no degree more likely to decompose than that prepared from ethylic alcohol originally—if it be exposed to sunlight.

If methyl compounds should be present, they are detected by the chloroform becoming dark-coloured or black when treated with concentrated sulphuric acid, or by the formation of a black oily layer when chloroform is treated with chloride of zinc.

If pure chloroform be shaken with dinitrosulphide of iron, it remains colourless. If the chloroform contains ether, aldehyde, or methylic alcohol, a dark colour results.

The impurity or product of decomposition of chloroform which we most commonly meet with is carbonyl-dichloride, $COCl_2$. It is an intensely irritating pungent vapour, which may be generated by keeping chloroform carelessly in a badly stoppered bottle, but we meet with it most commonly when an operation is done in a room with several naked gas-lights, or a gas-stove is burning. The result is that, after chloroform has been used for some time, the room contains a fair percentage of the vapour, which, coming into contact with the gas flame, generates $COCl_2$. I believe bronchitis has occurred from this cause in patients, but I have never seen this. On a number of occasions, however, I have known a room become unbearable from the irritating vapour, every one beginning to cough and sneeze and complain of headache, etc., and subsequently even of loss of taste—for tobacco!

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[1] *Pharm. Journ.*, London, December 14, 1898.

I have before me six samples of chloroform prepared by three different firms, namely, X., Y., and Z.

X. puts his chloroform, whether prepared from ethylic or methylic alcohol, in the same style of bottle and label, and states thereon, sp. gr. 1·490, and that the contents are guaranteed pure and answering all the tests of the Pharmacopœia. A small label is attached to the foot of each bottle, stating its exact source—ethyl or methyl.

Y. labels his ethyl-chloroform "prepared from rectified spirit" likewise; while his chloroform pure (by which name he prefers—and rightly, I think—to call his chloroform of methyl origin) is designated as "equal in all respects to the purest chloroform prepared from ethylic alcohol."

Now, Z. is very frank about the matter, and to make sure there is no deception he labels "ethyl" with a white label—emblem of virgin purity; while "methyl" is called methylated and adorned with a red label, which may mean anything.

Now, all these firms, X., Y., and Z., are above reproach—their names are household words; and it may be readily taken for granted that their products are exactly what they state them to be. They put their two brands up—to sell at a profit—and say they don't care which you buy; you simply take your choice and pay your money. To an unscrupulous chemist, however, knowing as he does know that the entity "methyl" has been expurgated, and generally exorcised from the alcoholic medium he is dealing with, along with all other undesirable bodies, and, in short, the quondam "methylated spirits" been reduced by fractional distillation and other resources of science to "rectified spirits," or ethylic alcohol, and rendered absolutely pure, does not a very great temptation face him to start *de novo*, as it were, and prepare his chloroform from his newly acquired ethylic alcohol, which has the great attraction of affording him some 3s. per lb. additional profit from having paid no duty.

I recently received a letter from an anæsthetic specialist of very high standing, who, in a paper written by him some years ago, stated that "methylated chloroform" is inadmissible for anæsthetic purposes. He says: "I always use both in public, and in private work, a brand of ether which I know is made—but very carefully made—from methylated spirit, and have no better, but certainly no worse, results than others." He adds that the amount of chloroform he uses is so small, comparatively speaking, that difference in price of the "pure" and the methylated chloroform is inappreciable.

Such an attitude appears to me to be inconsistent, for anæsthetics prepared from methyl-alcohol are either admissible for inducing anæsthesia *or are not,* and this must apply to both ether and chloroform.[1] Moreover, were there a percentage of methyl compounds left in the ether, the patients would inhale a large amount of them, seeing much more ether is needed to maintain anæsthesia *pro rata* than chloroform; and ether prepared from methylated spirit is more prone to impurity than $CHCl_3$.

The position of other surgeons—*i.e.* who use methylated chloroform for hospital practice and pure for private—is obviously equally untenable.

So long ago as 1850, Dr. John Snow, the eminent chloroformist, said:[2] "Many persons, especially in Edinburgh, have attributed the fatal cases to the impurity of the $CHCl_3$ employed, but, in the first place, it has been examined, and in nearly all the cases found quite good. And again, although it might contain impurities which would cause irritation at the time, and subsequently disagreeable effects, it could not be contaminated with anything likely to cause sudden death; and, before this assertion is repeated, we ought to be told with what substance stronger than itself is $CHCl_3$ likely to be contaminated. I fully admit the necessity of having $CHCl_3$, as well as other medicines, quite pure; and its adulteration, though not liable to cause death, may cause disappointment and other disagreeable consequences; and it must be admitted that this, as well as other drugs, is liable to impurity in London as well as elsewhere. I am of opinion, however, that impure $CHCl_3$ has not been supplied by the respectable houses of this city."

In "White and Humphrey's Pharmacopœia," 1898, we find the following:—

"It has been stated that fatal effect following the use of chloroform is due to impurities. This is, however, highly improbable, because samples of chloroform which have caused death have been examined, and have been found to contain no other impurity than the added alcohol. The so-called methylated chloroform of commerce is prepared from methylated spirit. *If properly purified, it is identical with that prepared from rectified spirit,* because any products formed from the naphtha used for methylating the spirit are completely separated during purification and rectification."

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[1] The writer would not for one moment suggest that crude methylated ether be used for inhalation. Only that form which has been specially purified and is labelled "anæsthetic ether," should be used.

[2] *Med. Times and Gaz.*, London, August 1850.

I have consulted an eminent analytical chemist on this question, and he tells me that from his experience he considers there is nothing whatever in properly prepared "methylated" $CHCL_3$ to render it in any way less suitable than the "pure" for inhalation; and, further, he thinks that, provided the drug be obtained from a thoroughly reliable house, the "methylated" may be considered preferable; for the manufacturer, knowing he is obtaining it from an impure source, will be at special pains to render it pure, and quite what he guarantees it to be.

In two chloroform fatalities reported by Kappeler, one specimen of chloroform was found to contain allyl-chloride, but this had had no ill effect on other cases; in another, higher combinations of chlorine were found. Professor Ringer has drawn attention to the fact that the toxicity of the ethyl-alcohol series increases with each step, *i.e.* propylic is more poisonous than ethylic, butylic than propylic, and amylic than butylic; and the same, of course, applies to combinations and derivatives.

Rose Bradford and L. Hill say[1]: "It is extremely doubtful whether impurities in chloroform have ever led to fatal consequences." Heyman and Dibuck conclude from their experiments that *pure chloroform* possesses greater toxicity than the mother liquid separated from it by crystallisation (Pictet's method). Hüter had reported one case of death from impure chloroform; only one-third of the drug distilled at 62° F., and the residue had a strong odour of phosgene gas and carbon chloride.

As to the toxicity of *chloroform impurities*, the following incident will show pretty clearly that it is comparatively insignificant:—

A small boy about 10 years of age was once playing about a chemical works. He came across an open vat or tank which was very nearly his own height. He leaned over the side with boyish curiosity to inspect the contents, and was at once attracted by the not unpleasant—rather sweet—aroma arising from them. He took one sniff, with his head bent over the rim of the tank, and then some more. Finally he lost count of his sniffs, and some minutes later was picked up in an unconscious state alongside the vat. The contents of the vat were the waste products and "mother liquor" separated in the preparation of chloroform. The unconsciousness was, of course, produced simply by the physiological action of the waste chloroform still remaining. No effect other than temporary loss of consciousness was produced, although the boy was for some minutes inhaling a concentrated vapour of chloroform in about as impure a condition as could well be imagined.

The fact of the matter is, that chloroform is one of the most powerful poisons we use therapeutically, and is used with such laxity, as regards dose and method of exhibition, by all and sundry, that the only wonder is more fatalities do not occur. Moreover, there seems no question that it sometimes has what has been described as a "capricious" action (*pace* Colonel Laurie), even the purest chloroform; but the most astute and highly trained chemist fails to find any demonstrable toxic bye-product to account for this.

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[1] Hale White's "Text Book of Therapeutics."

Further, did we employ chloroform prepared from methyl-alcohol, which had only partially been rectified, it seems highly questionable if the methylic impurity would cause any trouble. Thirty years ago, "methylene" was a most popular anæsthetic. Sir Spencer Wells used it with great success, and found after-sickness much less common; and induction of anæsthesia and recovery from it both more rapid.

Nussbaum of Munich used it in 15,000 cases, without a fatality.

On analysis, what was "methylene bichloride" found to consist of? Simply a mechanical mixture of chloroform with 20 *per cent. of methylic alcohol* (Hofmeister).

When a death from chloroform occurs in an institution, or in private practice, it is quite usual for those concerned to examine the offending specimen of the drug, and find out the source and maker's name, if there is any doubt about it. On discovering it is Blank's Pure Chloroform, "entirely prepared from British Ethylic Alcohol," a sigh of relief (?) is heard, and one is ludicrously reminded of the remark of Lewis Carroll's "hatter" as to the quality of butter he used to lubricate his watch.

Institution	Chloroform, "Pure," Ethyl.	Methyl.	Ether, Methylated.
Edinburgh Royal Infirmary	360 lb.	120 lb.	...
Aberdeen ,, ,,	...	120 ,,	90 lb.
Dundee[1] ,, ,,	128 ,,	12 ,,	...
Glasgow ,, ,,	374 ,,	...	...
,, Western Infirmary	360 ,,	...	...
,, Victoria ,,	150 ,,	...	90 ,,
Royal Hospital for Sick Children, Glasgow	60 ,,	...	...
Royal Hospital for Sick Children, Edinburgh	96 ,,	...	...
Leith Hospital, Edinburgh	...	150 ,,	...
Deaconess Hospital, Edinburgh[2]	...	Uncertain	Chiefly

Professor Ogston, *Ency. Med.*, art. "Anæsthetics," remarks: "There is no advantage in using "pure chloroform"—that is, chloroform prepared from pure alcohol. "Methylated" chloroform manufactured from methylated spirit is as good, as pure, and as safe, and costs considerably less."

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[1] The medical superintendent says "less vomiting was found to occur with the 'methylated' $CHCl_3$, and hence they are using it at the present time."

[2] The two last-named hospitals have used $CHCl_3$ prepared from methylated spirit only for the last six years.

To come to the practical or economic side of the question, what is the result of this strange hankering after "purity," as represented by duty-paid alcohol among the profession? In four out of five of the principal hospitals in Scotland we find that only chloroform prepared from *pure* ethylic alcohol, to the total amount, per annum, of over 1500 lb., is used, causing an extra and entirely unnecessary annual expenditure of, approximately, 1500 × 3s. 6d. = £265; enough, according to Burdett's "Hospitals," to support five beds with ease. Considering the constant clamour as to want of funds for our hospitals, this has quite a serious aspect, for in ten years this means an expenditure of £3000 and over, taking interest accumulated into consideration.

The same question, of course, applies in a minor degree to the annual expenditure of the general practitioner on the item chloroform. It may amount to £5 on the average per annum, or less; but most men will think twice before they expend £5 extra annually, entirely unnecessarily—not for the benefit of the chemist he patronises, but simply to go into the coffers of the Exchequer, in the form of Inland Revenue.

TREATMENT OF CHRONIC SUPPURATION IN THE FRONTAL SINUS.

By H. LAMBERT LACK, M.D. (Lond.), F.R.C.S., *Aural Surgeon to the London Hospital; Surgeon to the Hospital for Diseases of the Throat, Golden Square, London.*

THE treatment of chronic suppuration in the frontal sinus presents extremely difficult problems, and is still the subject of acute controversy. Some hold that intranasal methods should be adopted, and condemn external operation altogether; whilst others, although admitting that relief may be obtained by intranasal treatment, believe that an external operation affords the only reasonable hope of cure. Further, many different methods of external operation have been from time to time recommended. The principles of the more important of these operations need elucidation, and the whole subject offers scope for discussion.

A preliminary word must be said as to diagnosis. This is generally arrived at by a process of exclusion. If, on examining the nose in a case of suspected accessory sinus suppuration, pus appears to come from under the middle turbinate, and if, on wiping away all discharge, pus reappears in this position, it is fairly safe to conclude that it comes from one or more of the anterior set of accessory cavities, that is, from the *antrum, anterior* *ethmoidal cells*, or *frontal sinus.* Antral suppuration should first be eliminated by puncturing and irrigating that sinus; next, the anterior ethmoidal cells should be opened up, and, if pus still continues to come away in any quantity, there is strong presumptive evidence in favour of suppuration in the frontal sinus. But it is only presumption; for ethmoidal cell suppuration is not definitely excluded, and there are rarely any reliable positive signs of suppuration in the frontal sinus. Transillumination is very unreliable, for the frontal sinuses vary much in size and in the thickness of their walls. The sinus may not be darkened when it is the source of the pus, or it may appear dark when empty, because its walls are thick. The unreliability of probing the sinus will be discussed later. Questions of treatment cannot therefore be settled by an appeal to statistics, for those bearing on intranasal methods are all invalidated by the fact that a certain diagnosis is only possible after the sinus has been opened externally. This conclusion seems inevitable, and must be carefully weighed when considering the value of intranasal treatment.

Generally speaking, there are two principles underlying all the various methods for the cure of suppuration in a nasal accessory cavity. In the one, it is sought to restore the sinus to its normal condition; in the other, to obliterate it. To attain the first of these objects, it is necessary to establish free drainage of the sinus, to remove the pus, and to promote the return to a healthy condition of the lining mucous membrane. In frontal sinus suppuration, much may be done towards this object by thoroughly clearing the approach to the lower end of the infundibulum. To do this, the anterior end of the middle turbinate should be removed by a typical amputation with combined use of cutting forceps and wire snare. Then, if any polypi are present, they should be snared, or, better still, an anæsthetic should be given and the anterior ethmoidal region firmly and freely curetted with a sharp ring knife. By this means not only are all polypi in this region radically extirpated, but some of the anterior ethmoidal cells are opened, and the uncinate process is broken down and removed. It is especially important to break down the uncinate process, as it forms a great hindrance to the passage of a cannula into the sinus, and the mucous membrane covering it is very liable to become œdematous and block the opening of the infundibulum.

This treatment, by which a clear approach is obtained to the infundibular region, usually gives great relief, and may effect a cure; in any case, it will aid the success of a subsequent operation. Should a cure result, it does not prove that the case has or has *not* been one of frontal sinus disease, but it seems a fair presumption to suppose that some cases of suppuration in the frontal sinus may be cured by providing the free drainage which is thus obtained. Thus far surgeons are practically agreed. But should this treatment fail, as it often will, there is a very great difference of opinion as to whether further intranasal treatment should be adopted, or whether it is a mere waste of time or actually dangerous. If intranasal treatment be continued, the next step is to wash out the sinus through a cannula passed up the infundibulum. An examination of numerous dissections of the nose will convince any one that this manipulation is very often impossible. The chief difficulties arise from the prominence of the middle turbinate, which overlies the approach to the infundibulum, from the uncinate process, from the bulla ethmoidalis if very large, from the occasionally long and tortuous course of the infundibulum, and from the openings of the anterior ethmoidal cells, into which the probe is very liable to pass. The infundibulum is also an irregular passage, and not uncommonly (according to Lothrop, in fifty per cent. of cases) the frontal sinus opens by a short straight canal into the roof of the middle meatus, and not into the infundibulum or hiatus semilunaris at all. If the anterior end of the middle turbinate be removed, and especially if a piece of the uncinate process be also taken away, access to the infundibulum is facilitated, and with great care and patience the passage of a suitably curved cannula will probably succeed in about fifty per cent. of cases. But the chief difficulty remains, that, even in cases in which the probe has been passed far up into this region, there is no certainty that it has really entered the frontal sinus and not passed into some of the ethmoidal cells. It is this want of a certain criterion, rather than the difference in the method practised, which probably accounts for the great divergence of opinion existing as to the frequency with which probing of the sinus is possible in the living. Thus Lichtwitz states that he could pass a probe into ten out of thirteen sinuses; Jurasz could reach the sinus in about half his cases; while Rethi could only pass a probe in six out of twenty-six. Symonds says when the way to the infundibulum has been cleared irrigation of the sinus is easy, and other observers seem to agree. Lothrop, Macdonald, Grant, and others speak hopefully of the success of this method.

If it be decided to try it, the approach to the lower end of the infundibulum should be thoroughly cleared as above directed, and when healing has occurred an attempt made to enter the sinus under cocaine, with a soft, easily bent probe. Care should be taken to find the most suitable curve to give the probe, and the direction in which it passes most easily. A cannula is then bent to the same angle as the probe, and is reserved for the one case. If it can be inserted, the sinus should be washed out daily with a mild antiseptic solution, such as boracic acid. After a time other antiseptics may be used, and recently formalin 1 in 1000 or 2000 parts of water has been strongly recommended.

This treatment should be repeated daily for from three to six weeks, provided improvement is obtained. The chief objections are that it requires to be carried out daily by the surgeon himself, and that it generally fails to produce other than temporary benefit. It is probably not attended with any serious risk, such as perforating the floor of the skull, provided force is carefully avoided. The treatment should be reserved for those cases in which the patient is very averse to an external operation, in which irrigation of the sinus appears easy, and in which no urgent symptoms are present. I have carried it out in six cases which appeared to be very suitable, and in three there was considerable improvement, but in none could it be said that complete success was obtained.

When there is any difficulty in entering the sinus, the treatment should be at once abandoned, for all methods of puncturing the sinus from the nose must be strongly condemned as both useless and dangerous.

If intranasal treatment fails or is abandoned, the question arises, whether it is better to leave the patient alone or to perform an external operation. Unfortunately, in the past, external operations have been by no means free from danger, and they have frequently failed to cure. On the other hand, the risk of leaving the disease alone does not seem to be great, provided free drainage is maintained. In some of my cases, suppuration has existed for ten, twelve, or even sixteen years, without affecting the patient's general health or impairing his usefulness. Further, changes in the bony walls of the sinus are seldom found, and cerebral complications are extremely rare.

Therefore, in cases in which no symptoms are present other than persistent nasal discharge, the facts should be clearly put before the patient, and the decision must be left with him. In these circumstances operation should never be urged, and the patient will often decline it, in which case he should be seen from time to time so that a free passage may be maintained for the escape of the discharge into the nose.

Operation, however, may be required for one or more of the following reasons:—

1. *Pain,* which may be severe. In three of my cases it was described as maddening, and, though intermittent, it lasted for hours, or even days, at a time, during which the patient was totally incapacitated. In other cases there was frequent and severe headache, rendering the patient unable to work or attend to household duties; nearly three-fourths of my cases were operated upon for this reason.

2. *Deficient drainage.*—The opening into the nose may be small or frequently obstructed, and in these circumstances delay in operating may be dangerous.

3. *Bulging of the cavity or a discharging external sinus.*—These conditions imply disease of the bony walls, and imperatively demand operation.

4. *Symptoms of cerebral trouble* are an urgent indication for operation.

5. *General ill-health,* if apparently due to the disease.

As operative methods improve, it may be possible to advise operation in nearly every case, in order to stop the irritating nasal discharge and to remove the liability to complications.

METHODS OF OPERATION.—The sinus may be simply opened and drained externally, or the infundibulum may be enlarged, and the nasal portion of the floor of the sinus removed, with immediate closure of the external wound, thus providing nasal drainage only, or both external and nasal drainage may be provided. On the other hand, the sinus may be entirely obliterated. Whichever method be adopted, the sinus may be exposed through an incision along, or just below and parallel to, the supra-orbital margin, or by means of a vertical incision. The former is to be preferred, in that it allows free access to the inferior wall of the sinus, and may conveniently be prolonged downwards at its inner end to expose the infundibulum, or extended outwards to the outer limit of the sinus, while the resulting scar is almost entirely hidden by the eyebrow, and even a small depression in this situation becomes in time hardly noticeable.

Having exposed the bone, the periosteum should be detached from a small area of the supra-orbital margin and inferior wall of the sinus, at a spot vertically above the inner canthus. The piece of bone thus exposed is removed with a chisel or gouge. It is better to open the sinus through its inferior wall rather than through the anterior, as the upper portion of the sinus is less constantly present than the lower or orbital part. It must be remembered that there is no diploë at all in the inferior wall of the sinus, and therefore, when the bone is cut into, should diplöic tissue be met with, it may be assumed that the frontal sinus is absent, and the operation should not be persisted in.

Having opened the sinus, a probe is passed in to ascertain its extent, and the opening is enlarged sufficiently to enable its interior to be thoroughly examined. Should pus be found, the skin incision should be prolonged sufficiently to enable the whole of the sinus to be reached, and the periosteum should be detached from its walls. In displacing the periosteum from the inferior wall of the sinus, the pulley of the superior oblique may be detached, but this need cause no anxiety. Temporary diplopia has occurred after operation, but was probably due to effusion into the orbit and not to interference with the muscle; the pulley soon obtains a fresh attachment, and no permanent trouble results.

If the sinus contains polypi, these must be removed, and the bony walls must be very carefully examined for caries, perforations, etc. In a case reported by Lothrop, the patient died three months after operation, from cerebral disease, and a perforation was found in the outer part of the posterior wall, which had probably existed, but had been overlooked, at the time of the operation. The question now arises, as to whether drainage alone should be relied on, or whether the sinus should be obliterated. Obliteration leads to a certain and usually a speedy cure, and is certainly to be preferred when the sinus is not too large. It is necessary to do it when the mucous membrane is extensively degenerated, when there is caries or necrosis, especially of the posterior wall, and whenever cerebral symptoms are present. In other cases, and especially when a large sinus is met with, most operators prefer to rely upon drainage.

The method usually adopted is that first introduced by Ogston in 1884, and subsequently modified and improved by Luc, and known as the Ogston-Luc operation. Having opened and cleared out the sinus, as already described, a large opening is made down the infundibulum with curettes into the nose, and then a drainage tube with a funnel-shaped upper end placed in the sinus, the lower end protruding from the anterior nares. The funnel-shaped end of the tube serves to retain it in the sinus, but the same object may be better accomplished by using an ordinary drainage tube, and fixing the upper end in the sinus with a suture which is passed through the skin. The external wound is then entirely closed. This tube can rarely be retained for more than five to ten days because of the irritation it produces. It is removed by cutting the suture and pulling it out through the anterior nares. Some operators—Lothrop, Hill, etc.—go so far as to advise that no tube should be used, relying entirely on the large opening which is made into the nose.

This method is successful in so far that it drains the cavity for a time, and allows the external wound to heal, but the ultimate results are most unsatisfactory. It is necessary to examine these results in some detail. Even Luc admits that he has had many failures, stating that he has operated in fourteen cases, of which one died, and in the other thirteen recovery was generally obtained after a single operation and sometimes after a second one,—a rather vague statement. In the case which ultimately ended fatally four thorough operations had failed to effect a cure. In eleven cases in which I have operated by this method, not one has been completely successful. In four, headache and pain were relieved, but discharge, although much diminished, continued. In five there was no relief at all, and in two of these there was considerable trouble; pus re-formed in the sinus, and burst open the external wound, which discharged for weeks, necessitating the wearing of a small drainage tube, for as soon as the sinus was allowed to close, tenderness and swelling reappeared. Finally, in two cases the operation was followed by acute septic diploitis of the frontal bone, which proved fatal. In three cases it was necessary to reopen the sinus some time after the operation, and the conditions found were interesting. In one, the cavity was reopened fourteen days after operation for reaccumulation of pus; there was exuberant granulation tissue at the site of the external wound projecting into the sinus, and the passage into the nose, although admitting a tube, was blocked by polypi and œdematous swelling. In the second case, the cavity was reopened two months after operation for suspected reaccumulation of pus. A subperiosteal abscess had formed over the frontal bone, and whilst opening this the sinus was explored. It was found to be nearly obliterated, the lining membrane, which was greatly thickened, having come in contact with the granulations springing from the external wound. This result is probably exceptional, and was due to the fact that the cavity was a small one, that a very large opening had been made into it, and that the lining mucous membrane and periosteum were abnormally thickened. A third case was opened four years after operation, as the symptoms—severe headaches and profuse purulent discharge from the nose—persisted. The sinus contained pus and granulations, the posterior wall was carious, and the dura mater exposed. The scar of the previous operation bulged into the sinus, and the large communication with the nose contained polypi. It seems likely that this result may prove a typical one. The raw surface of the wound left to form the anterior wall of the sinus must produce granulations, which will naturally sprout into and partially fill the cavity; should they quite fill it, a cure will result, but should they fail to do so, as must happen in a large cavity, they only serve to obstruct free drainage from the outer part of the sinus. This condition is obviously dangerous, and should such a result prove to be common, it is sufficient to condemn the operation.

Again, the operation is attended by considerable danger. Luc published in August 1899 a fatal case of diffuse septic osteitis of the frontal bone, and Tilley and Rudloff recorded similar cases. Luc's patient was a robust young man of 20. Lermoyez performed the first operation on the left frontal sinus for nasal discharge of one year's standing. Three years later, as the symptoms continued, the operation was repeated. Fifteen months later, the right frontal sinus and antrum were affected, and were opened. The frontal sinuses were thrown into one cavity, scraped out and drained. Pus soon re-formed, and seven weeks later a fluctuating swelling in the inferior frontal region had to be opened. Soon another subperiosteal abscess formed, and on opening it the frontal bone was found rough and covered with fungating granulations. Subsequently other subperiosteal abscesses formed, and were opened; but a peculiar spreading osteitis had become established, and the disease continued to creep onwards, until finally the patient's strength began to fail, an extradural abscess formed, and caused death.

Rudloff's case was similar, but more acute. A second operation was performed a few days after the first, owing to caries of the posterior wall of the sinus. Seven days after this, severe symptoms set in. The whole infiltrated part of the frontal bone was removed, but failed to stop the infection, and the patient died of purulent lepto-meningitis.

In Tilley's case pus re-formed and distended the wound ten days after the first operation. The sinus was again drained, but seven days later a subperiosteal abscess formed. This was opened, but others formed, and in spite of repeated operations the disease slowly spread, and after nine months' illness the patient died of cerebral abscess. Dr. Tilley suggested that too severe curetting had opened up some of the diplöic spaces at the upper border of the cavity, and thus had opened the door to infection.

Two cases have occurred in my own practice:—

Case 1.—The first, a man æt. 43, became acutely ill fourteen days after operation on the right frontal sinus. The wound was reopened, the walls of the sinus cut away, and the cavity obliterated. In spite of this, repeated subperiosteal abscesses formed in the frontal region, the disease ran an acute course, and the patient died, with signs of cerebral complications, seven weeks after the first operation.

Case 2.—The second case was that of an otherwise healthy girl, æt. 21. One sinus reopened the fifteenth day after the operation, and some pus escaped, but the wound soon closed again, and gave rise to no further trouble. The other sinus healed, but a puffy swelling appeared, seven days after the operation, in the supra-orbital region. The temperature rose slowly from 99° F. to 100° F., and the patient complained of severe headache. An incision let out a mere drop of pus, but the frontal bone was bare and rough and the periosteum greatly thickened. Subsequently, other abscesses were opened, and then an attempt was made to check the spread of the disease, by making a transverse incision right across the frontal region, removing the whole of the external plate of the frontal bone, and thoroughly scraping the diplöic tissue. This was followed by temporary improvement, and several sinuses healed, but eventually the osteitis spread to the parietal and temporal bones, the mastoid became affected, and the patient died of cerebellar abscess.

I have seen three other cases, which remain unpublished, and have been informed of others. These facts show conclusively that external operations on the frontal sinus performed in this way are attended by considerable danger. They also show, I think, the explanation. Tilley's suggestion is contradicted by the fact that, in my own cases, at any rate, curettement has never been practised, the mucous membrane being as far as possible left intact. Two facts stand out prominently in all the records—first, that the infection commenced in the anterior wall of the sinus; and secondly, that pus had in each case re-formed in the sinus, and that it existed there under sufficient pressure to distend or even burst open the operation wound. Now, the anterior wall of the frontal sinus normally contains a certain amount of diplöic tissue, and therefore it is only reasonable to expect that pent-up pus in contact with the recently opened diplöic veins should give rise to infection. Thus every operation on the frontal sinus, to be safe, must provide good drainage, and from the considerations above adduced, from the many reported cases of failure, quite apart from the fatal cases, which would probably form no small percentage if all were published, it is conclusively proved that the method of drainage provided by Luc's operation is neither safe nor curative. Unless, therefore, obliteration of the sinus can be obtained, some method for providing efficient drainage must be adopted. The following method has given better results:—

The frontal sinus having been opened and the infundibular passage cleared in the usual way, a large rubber tube is passed down into the nose, and its upper end fixed externally in the inner angle of the incision; the rest of the wound is sutured. On the fifth to the seventh day this tube may be replaced by a curved rubber or vulcanite plug, with a collar resting on the supra-orbital margin. The lower end of this plug should just reach the middle meatus. Such a tube can be easily removed once or twice daily, to allow the sinus to be syringed, and may be worn for weeks or months without giving rise to irritation. After the wound has healed, no dressing need be worn. This procedure, which had already given good results, but which I had abandoned because of the more brilliant and rapid results claimed for the Luc method, I have recently used again. No unfavourable results have occurred; and although the results are neither so rapid nor so certain as those obtained by obliteration, it has always relieved the more severe symptoms, and has never resulted in any ill effects.

To obliterate the frontal sinus, the method of Kuhnt is the most reliable. It consists essentially in removing the whole of the anterior and inferior walls of the sinus. The entire mucous membrane is curetted away, and the infundibulum enlarged by removing the entire nasal portion of the floor of the sinus. The soft parts are then sutured, and allowed to fall back into contact with the posterior wall of the frontal sinus. After this operation, I consider it much safer to maintain drainage in the manner above described for a few weeks, or until all discharge has ceased. In cases treated by this method no serious symptoms have yet arisen, and in all a permanent cure has been obtained. When the sinus is small, the resulting deformity is extremely slight or almost unnoticeable, and even when large sinuses are met with the disfigurement is not nearly so great as might be anticipated. I have performed it in nine cases, and increased experience leads me to consider it the best method in almost every case.

Finally, a word may be said as to external drainage.

Where this alone is practised, it is obvious that a cure depends upon the mucous membrane of the sinus returning in a short time to a healthy condition, as a permanent external opening in this region cannot be tolerated. The operation is therefore not likely to succeed in many cases, and offers no advantage to the method of providing nasal drainage which has been above described.

The treatment, then, of chronic suppuration in the frontal sinus may be summed up as follows:—

1. In all cases of suspected suppuration in the frontal sinus, intranasal treatment should be tried in the first instance. This consists in (*a*) securing free access to the lower end of the infundibulum by removing the anterior end of the middle turbinate, part of the uncinate process, and opening up the anterior ethmoidal cells, and at the same time removing any polypi or other obstruction that may be present, followed by simple nasal irrigations for a few weeks; and (*b*) in favourable circumstances this may be followed by cautious attempts to wash out the sinus through its natural opening, but on no account should an attempt be made to forcibly enter it from the nose.

2. If this method fails, and serious symptoms are present, the frontal sinus should be opened externally, and should be obliterated—(*a*) when it is not very large, for then the cure is certain and the resulting deformity is slight; (*b*) when the posterior wall is carious or perforated; (*c*) when cerebral symptoms are present; and (*d*) even when the sinus is large, if the patient does not object to run the risk of deformity.

3. In all other cases a free opening should be made into the nose, and *free drainage maintained until all suppuration has ceased.*

4. Operations providing external drainage only are inefficient, and operations allowing of intranasal drainage for a limited time only are both inefficient and dangerous.

With regard to the deformity sometimes produced by these operations, the following suggestions seem worthy of trial. A very depressed scar might be excised, and the upper edge of the incision undermined, so as to bring a thick flap down from the frontal region, which could be sutured in position and thus the depression obliterated.

Where an extensive depression results, a bony or metal plate might be inserted, or, as recently suggested, a mass of solid vaseline introduced.

TUMOURS OF THE UPPER JAW.[1]

By WILLIAM H. BATTLE, F.R.C.S., *Surgeon to St. Thomas's Hospital, London.*

(PLATE XI.)

I HAVE selected the subject of tumours of the upper jaw for the subject of the clinical lecture to-day, because we have not only two very typical examples in the wards at the present time, but there have been several under treatment during recent months; and some of you have seen most of them. They have been examples of malignant disease for the most part, either carcinoma or sarcoma, and confirm certain statements as regards the characteristics of those growths, as now generally accepted by the profession. The consideration of epulis is not included, as we have recently said enough in the ward on this subject. There is hardly time to describe many cases to you, but we shall, I hope, find a study of some of the more recent ones not unprofitable. My endeavours to bring together some of the older cases that you might see them has not been very successful.

Carcinoma, when it arises in the gum, the alveolus, or in the antrum, is most commonly of the epitheliomatous type, and if it arises in the gum, invading the bone secondarily, presents very little that requires special notice. I would, however, recommend a wide removal of the disease, as the only thing possible to prevent a rapid and fatal extension. We have had two cases under treatment of this kind during the past twelve months, and one of them, originating in the neighbourhood of the last upper molar on the right side, had already extensively invaded the soft parts when seen by Dr. Hodgson, who sent him to me. The disease had been insidious, but less so than in other cases of carcinoma, when the disease begins in the alveolus. I shall refer to epithelioma again presently.

The most common form of carcinoma is the spheroidal-celled, which originates in the nose, frequently in the inferior turbinated bone. This kind of growth is especially worth attention, as it is very insidious in its onset and rapid in its course, whilst, in the amount of actual tumour produced, it resembles sarcoma. A good example is that of the patient on whom I operated on Friday last (February 7), and the remains of whose tumour I show to-day.

CASE 1.—He is a man of 60, a bookmaker, who was admitted to the Leopold Ward on February 3, 1902, having been sent to me by Dr. Furniss Potter. He presented a good colour and looked healthy, whilst the swelling of the right cheek which he presented was so little marked, that the gentleman who was asked to photograph him refused, "as it would not show anything." And yet the specimen has been so crushed in the removal, that it is obvious the disease had been very destructive; in fact, with the exception of part of the alveolus, with some teeth attached, and the tuberosity of the superior maxilla, there is little to indicate the anatomical structure of the upper jawbone in the specimen, whilst the soft growth has a granular, crumbled appearance, which, on microscopical examination, is typical of spheroidal-celled carcinoma. The history of the case is as follows:—Three months ago he felt that there was something wrong with the right nostril, which gradually became blocked. At the same time the eye began to water. Then a blood-stained discharge from the right nostril began, and he noticed a swelling on the right side of the roof of the mouth. He was examined a fortnight ago, elsewhere, and a good deal of bleeding followed the examination. He was admitted into another hospital, and as much as possible of the growth cleared out. There is a history of bladder trouble, and he states that he was told four years ago that he had a growth there, but his symptoms are not now those of a growth, so any question of the tumour being a secondary one can be dismissed. On admission, the right cheek was pushed forward by a tumour, over which it did not move quite easily, and the lower eyelid was œdematous, whilst the upper margin of a growth could be felt on firm pressure, just below the orbital plate. There was some epiphora, but no loss of vision. In the mouth there was an elastic swelling, which extended beyond the middle line. The alveolus appeared normal; the anterior surface of the jaw above this was occupied by tumour. The projecting parts of the growth were elastic, and without any egg-shell crackling. No air could be drawn through the right nostril, which was completely blocked by a fleshy growth, which somewhat distended the nostril. He had no pain, and there was no enlargement of the neighbouring glands.

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[1] A Clinical Lecture delivered at the Hospital, February 12, 1902.

The cheek is a fleshy one, and as it was invaded by the growth on the under surface, a certain amount of care was required in order to raise the flap without encroaching on the tumour. The patient was placed in a sloping position, the head being at a higher level than the trunk, and turned to the right. By this means the veins were kept emptied, and the loss of blood diminished; there was also less chance of blood passing into the pharynx. The upper part of the flap, from the malar bone to the ala nasi, was first made, all bleeding vessels being secured by forceps at once. The incision (Fergusson's) was then continued into the mouth, and the remainder of the operation continued as usual. On account of the extension of the growth, the bones were divided further back over the zygoma than is customary, also to the left of the middle line in front, as the bone was evidently infiltrated beyond the vomer. Only one artery required ligature after the removal of the bone, forcipressure had sufficed for the others. The wound was washed out with perchloride of mercury (1 in 1000), a plug of cyanide gauze placed in the cavity from which the jaw had been removed, and the flap carefully adjusted over it, with interrupted fish-gut sutures. Over the line of the wound a strip of gauze was placed, saturated with Whitehead's varnish. No bandage was applied. Chloroform was given by Dr. H. Low, and was well taken, though at the time of removal of the tumour with the lion forceps, the pulse failed considerably. His progress has been good since the operation, and it is almost difficult to believe that the man has recently gone through such a severe operation.

From what you have heard you will have gathered that the disease was extensive, and is likely to return, and this is unfortunately true. But operation has given him a fresh lease of life, and it is probable that he will suffer less with the recurrence than he would have done had the original tumour been left to expand unchecked.

The woman on whom I also operated on Friday, for (a recurrence of) spheroidal-celled carcinoma, furnishes an example of the good, if only temporary, effected by operation in these more severe cases, for the tumour was even more extensive.

Case 2.—M. M., a dressmaker, æt. 50 (also sent to me by Dr. Furniss Potter), was admitted on July 17, 1901, and the right upper jaw excised on the 25th of that month. Two and a half years before, a small lump had been noticed in the right nostril, which was removed in December 1900. There had been a discharge from the nose since the tumour first appeared. She had also complained of some not clearly defined pains in the head. On admission, the right side of her nose below the nasal bone was larger than the left, a distinct tumour attached to the under surface of the bone and ala nasi, of very firm consistence, being felt. The nostril was filled anteriorly with a growth which almost projected through the anterior nares—solid and greenish grey. There was a yellow offensive discharge, but no tenderness or local pain, and no enlargement of the lymphatic glands. In removing this tumour and the upper jaw, of which the anterior and palatal surfaces were bulged, the operation was extensive, and it was found necessary to cut the ring of the right nostril in order to get at the growth under the ala and nasal bone, and separate it. There was an ulcer of the septum, where the growth had been in contact with it, which had most of the characteristics of a carcinomatous ulcer. After removal of the upper jaw, it was necessary to follow the growth towards the frontal sinus, a scraper being used to break away bone and remove growth. The operation was well borne, and when she recently found a return of the growth, in the situation of the inner angle of the orbit, she returned for operation at once before the skin was affected. This recurrence was found most extensive in the upper part of the nostril, but within reach of the knife. So far she has done well, but cannot be accounted amongst the cured. There are still no enlarged glands to be felt in the neck, or behind the jaw, but local recurrence can hardly fail to carry her off before many months have elapsed. She has very little deformity, or even scarring, to show the extensive operation previously undergone, and is able to do her work at home without any objection from her relatives. Her condition, when contrasted with that which must have been developed ere this without operation, speaks greatly in favour of operative interference.

Further evidence of the insidious onset of these growths is afforded by the following case:—

Case 3.—A., æt. 43, sent to me in 1899 by Dr. Ecklin. On the 21st of February she had suffered from severe epistaxis from the left nostril, which lasted for two days, and was then only arrested by plugging, to a limited extent, for she went home, and the bleeding continued for nearly the whole of the month of March. On the cessation of the bleeding, early in April, she found a lump in the left nostril, from which there had been a continuous discharge. Here there was a fleshy growth in the nostril, attached to its outer side (probably inferior turbinated bone), without evidence of invasion of antrum. No epiphora, enlargement of lymphatic glands, or local pain. An operation for removal of the growth from the nose was commenced, but terminated in excision of the upper jaw, as the antrum was found filled with growth. There was a considerable amount of shock on account of her feeble health, but the operation was easy and the bleeding slight.

Case 4.—In the case of the drayman, æt. 60, who was in the ward just before Christmas, he had noticed a tender swelling situated in his cheek for three months, and for the same time had noticed blocking of the nostril and sero-purulent discharges from it, but had continued his work. He had no pain and no enlargement of the glands. Operation would have been formidable here, on account of the size of the growth (this caused the usual symptoms of distension of antrum), and the fleshy character of the subject, but, whilst hesitating over the case, he developed an inflammatory swelling of the tumour and surrounding parts, on the subsidence of which there was a distinct enlargement of most of the glands in the affected area. This of course placed operation out of the question, more especially as the inflammatory attack was accompanied by bronchitis.

Any inflammation is, in my opinion, a serious complication of malignant growth, for it makes it spread more rapidly and delays operation. So much so, that I think it is advisable to be prepared to operate radically at once, should an exploratory examination of the upper jaw have been thought advisable, and a growth detected.

Case 5.—In one case of "boring" epithelioma, that of a lady, æt. 43, whom I saw with Dr. Godfrey of Finchley in 1901, an exploration was followed by inflammation, and I was only able to operate for excision of the jaw a month later, when the growth was doubtless making its way out of the antrum into the spaces around. It was somewhat of a surprise to find the antrum filled with growth, for the surface was quite smooth and without any œdema, or, in fact, obvious change beyond the bulging. The contents of the antrum were most offensive, and it had been almost impossible to prevent some discharge from getting into the mouth and stomach through the exploratory opening; so her general condition was impaired. She recovered from the operation, which was an easy one, but the growth recurred, and she died of exhaustion a few months later.

Some of you may have wondered what "boring" epithelioma is. In the above case the symptoms were somewhat similar to those manifested by the patient I now show you.

Case 6.—His upper jaw on the right side was removed for squamous-celled carcinoma on March 5, 1901, and he has continued free from disease since. About a month before he was admitted under my care, he had toothache on the right side, and noticed a swelling near a carious stump, which was supposed to be an abscess, and the stump was pulled out, but no relief followed. Other teeth were drawn without much benefit, and the swelling had been incised with (so it was stated) evacuation of pus. On admission there was well-marked swelling of the anterior surface of jaw, and it seemed that a growth was creeping along the anterior aspect, but not invading the antrum. The upper jaw was excised in the usual manner, but the malar bone was divided further back than usual, and the whole of the bone taken away. This partly accounts for the deep depression below the orbit, but the eyesight is not affected. There have been no enlarged glands discovered in this case. The man looks well, and is working as a painter. He uses his plate when at meals, but in the interval prefers to keep a lint plug in the position of the gap on the right side of the palate.

It is rash to venture a diagnosis from sarcoma in some of these patients; in fact, some of the growths removed from the cases under consideration were sent to the Museum from the operating theatre, labelled "Sarcoma."

CASE 7.—*Naso-orbital sarcoma.*—In the case of a woman, æt. 60, under treatment in Beatrice Ward, from the 4th to the 17th of November of last year, the growth was much like that of carcinoma, with excessive hæmorrhage. She had noticed "a cold" five months before, which had, however, only affected the left nostril. In August her nose bled profusely, when she was out visiting, and it was difficult to arrest the bleeding. Since August there had been a pain in the left eye, but no further bleeding until a week before admission, when it was again profuse and from the left nostril. Dr. Furniss Potter, who sent her to me with the diagnosis of round-celled sarcoma (confirmed by examination after removal), arrested the bleeding, but she was wearing a plug in the nostril when she came. She had a blocked nose, a polypoid growth in the nostril, and an enlargement of the inner side of the orbit and corresponding region of the nose. The eye was displaced outwards and a little downwards. It was recognised that the growth involved parts very near the base of the skull, but as the danger from bleeding was pressing, removal of growth and upper jaw, which was involved, was carried out, but unfortunately with only temporary success. Great care was taken not to scrape a section of growth attached to the cribriform plate, but the mere breaking off of the large mass was sufficient to permit a septic absorption, ending in death from meningitis on the third day.

The growth in this case, in its external appearance, was very like that shown in the accompanying photograph—a sarcoma also, successfully removed some years ago. The man was without recurrence some months later, when Mr. Stewart, his medical attendant, wrote to me. The base of the skull was not involved, nor was there so much displacement of the eye.

I had hoped to have been able to show you a patient on whom I operated on the 11th January 1898, but he has not come, as requested. Mr. J. G. Turner, who sent him to me in the first place, assures me, however, that the man is quite well, and some of you may have seen him when he last came to the hospital.

Case 8.—Four years before admission he had noticed a swelling of the right cheek, and this had slowly increased, without pain. He was first seen by me eight months before admission, when there was a large solid tumour, which caused a considerable deformity of the face. I advised removal, although the tumour appeared innocent, because of the great likelihood of the supervention of malignant change. He agreed to come in for operation, but some of his friends, to whom the issue was of less importance, advised him to have nothing done. He came ultimately, on account of a very considerable and somewhat rapid increase in the posterior part of the tumour. The surface of the growth measured about 2½ in. at its most prominent part, which was still firm and bossy. In the mouth, the growth involved both the alveolus and hard palate on the right side. A part of the tumour about the last molar tooth was softer than the rest, and slightly movable, and there was some ulceration of surface near the tooth. It was this part of the growth that had increased so much of late. The cheek was not involved, nor were the glands enlarged. The operation of 14th January 1898 was followed by more arterial hæmorrhage than usual after removal of the bone, but it was easily stopped with forceps and ligature. The extensive operation calls, otherwise, for no special remark. In the after progress of the case, the oral surface of the wound became septic, and on the eighth day secondary hæmorrhage came on, which was arrested by plugging; it did not recur. The main growth appears to have been myeloid, but no report was returned concerning the nature of the more recent formation.

Case 9.—The woman from whom the specimen I now show you was removed, was sent into hospital on December 30, 1901, for supposed sarcoma of the upper jaw. A swelling on the left cheek was observable when she came in, and this was due to a bony enlargement, which extended from the incisor teeth to the tuberosity of the superior maxilla. The whole of the alveolus was affected, being widened, and the teeth irregular. Some of the teeth were pushed down beyond the level of the others, and directed inwards. The first symptom she had noticed was the dropping down of her left molar teeth, over fifteen months ago; this she attributed to the absence of the corresponding molars in the lower jaw, which had been extracted some time before. At the same time she noticed the swelling of the bone. Seven months ago she noticed numbness in the left cheek, after a confinement. There is a little tenderness when she bites on the left side, but otherwise she has no pain. The growth encroaches very slightly on the hard palate, and does not invade the nose. Operation was postponed, on account of the formation of a milk abscess of the left breast. On January 21, 1902, the patient being under ether, the left lateral incision was drawn, and, after the cheek had been well retracted, a quadrangular portion of the upper jaw on the left side was removed with chisel and mallet, the mucous membrane having been first divided with a scalpel and pushed up. The mucous membrane of the palatal aspect was peeled off the tumour, and covered the line of bone section with a flap. The hæmorrhage was

rather free, but was arrested by plugging. The antrum did not appear to have been opened. The tumour was an osteoma of loose texture, resembling in every way the change found in cases of leontiasis ossea. I think there are alterations commencing in the structure of the alveolus of the upper jaw, on the right side, of similar character, which may require operative treatment at some future date, but the other bones of the face show no change.

This case is important, as it is the only one I know of in which the formation of a sarcoma of the jaw has been so closely simulated by a growth of this nature, especially in the changes of position of the teeth. The specimen will be preserved in the St. Thomas's Hospital Museum.

In the case of sarcoma of the nose, the disease was dangerous from its situation, and not from its general effect on the system by dissemination in other parts of the body, and it is important to recognise that both sarcoma and carcinoma of the upper jaw show their malignancy, in by far the larger number of instances, by their great tendency to return locally. One or two of you may remember this case:—

Case 10.—H. H., a boy, æt. 19, who was admitted to my care on October 27, 1898. His case was a startling evidence of the occasional contrary behaviour of sarcomatous growths in this region, and their rapid progress. He was sent to me by Mr. J. G. Turner for a growth of the left lower jaw. It appeared that he had come under the care of Mr. Turner in consequence of the formation of a lump on the lower jaw, and that a tooth had been extracted. As Mr. Turner had been impressed with the appearance of the bed from which the tooth was extracted, he had taken some of the growth for examination and found it to be alveolar sarcoma. The operation was a fortnight later, when the growth was no larger than the terminal phalanx of the thumb, and consisted in the excision of the lower jaw, from the lateral incisor to the angle, an artificial jaw of vulcanite being secured in the gap so caused. He appeared to be doing quite well, until about ten days later, when he complained of his right upper jaw, which was swollen and painful. Incision gave exit to some pus and blood, the swelling being very vascular; but three days afterwards three teeth were extracted, and some pus evacuated by incision, under anæsthetic. The gum was much swollen. There was evidently new growth here, and the patient rapidly wasted and died on the 30th of November. There was slight hectic and nodular enlargement of liver during the last fortnight. Examination of these growths of the jaw showed in both a small round-celled sarcoma. At the post-mortem examination, the liver was of enormous size, full of a very soft white growth; the same may be said of the kidneys, mesenteric, and retro-peritoneal glands, and even of the intestines themselves. This growth was made up of rather larger cells, arranged more or less in columns with an attempt at alveoli—an alveolar sarcoma.

The progress of the disease was much like that of an acute tuberculosis, without lung signs or very marked rise of temperature. There appears no reason to doubt that the growth commenced in the lower jaw.

A consideration of these cases gives the chief points in the history of both sarcoma and carcinoma, and although two of the cases referred to had sarcoma when over 50 years of age, they are exceptions to the rule, that growths which commence after 40 are usually carcinomatous.

It will be noted that the absence of enlarged glands in the carcinomatous cases agrees with the observation on this point made by Butlin, in his work on "Operation in Malignant Disease," and differs from the statement of some of the text-books.

Mention was made of various growths which may affect the upper jaw from without, and photographs were shown of rodent ulcer, epithelioma, sarcoma, etc., which had been under the observation of the lecturer, in which the upper jaw has been invaded secondarily.

SOME PARALYSES OF THE ARM AND HAND.[1]

By H. Campbell Thomson, M.D. (Lond.) F.R.C.P., *Assistant Physician to the Middlesex Hospital.*

(Plate XII.)

Paralyses of the upper extremity may be primarily divided into two groups, namely—(1) those due to a lesion of the upper segment of the motor fibres, and (2) those due to a lesion of the lower segment. The upper motor segment, or neuron as it is usually called, has its origin in the motor cells of the cerebral cortex, and from there the fibres pass downwards through the corona radiata, internal capsule, crus cerebri, pons, and medulla; and finally, after crossing in the medulla, they terminate in the anterior cornua of the spinal cord.

The lower neuron of the motor system begins in the large motor cells of the anterior cornua of the cord, and thence is continued along the peripheral nerves to the muscles. The upper and lower neuron groups of paralyses may usually be distinguished from each other without much difficulty. The following are the chief points of difference:—

	Lesion of Upper Neuron.	Lesion of Lower Neuron.
1. Wasting . .	Slight, in consequence of disuse.	Very marked.
2. Reflexes . .	Increased.	Abolished.
3. Rigidity . .	Well marked.	Limb tends to become flaccid.
4. Electrical reaction	No definite change.	Reactions of degeneration.
5. Contractures .	Spasm of muscles gives rise to contractures (late rigidity).	Irregular deformities may develop, owing to unopposed actions of non-paralysed muscles.

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[1] An abstract of a Clinical Lecture delivered at the Middlesex Hospital.

In this lecture I propose to speak of some of the paralyses which depend upon disease of the lower neuron only.

The first illustration (Plate XII.) shows some of the effects produced by paralysis of the serratus magnus.

The serratus magnus has two important functions—(1) it fixes the scapula, in order to allow other muscles to exert their strength; and (2) it assists to rotate the scapula, when the arm is raised above the level of the shoulder. When the muscle is paralysed, there may be scarcely any deformity when the arm is at rest, but as soon as the arm is raised, the scapula, deprived of its fixation, rotates, and the result is that seen in the illustration, namely, a projection of the vertebral border of the bone, so as to produce a wing-like appearance; owing also to lack of fixation, very little force can be produced in the act of pushing with the arm placed horizontally in front of the body. The loss of power to rotate the scapula leads to weakness in raising the arm above the shoulder, though this movement can still be performed by the aid of the trapezius and other muscles.

The next example is that of a case of paralysis of the deltoid. The chief action of this muscle is to abduct the arm and to raise it to a horizontal position; the anterior and posterior fibres also move the arm forwards and backwards. When the deltoid is paralysed, the arm cannot be raised, and any attempt to raise it is accompanied by an associated movement of flexion of the trunk to the opposite side. Another interesting point to be noticed in deltoid paralysis, is that any attempt to raise the arm is at once accompanied by an extensive rotation of the scapula, owing to the efforts of the rotators of that bone to assist in the attempt at movement.

The case illustrated in the photograph was due to a dislocation of the shoulder, a not infrequent cause; the deltoid being supplied by the circumflex nerve, the latter easily becomes stretched or contused when the head of the humerus is forcibly dislocated, and therefore it is common to find some weakness after the dislocation has been reduced. When such cases only depend upon some stretching, or contusion of the nerve, recovery usually soon takes place under suitable treatment; but, of course, in more severe cases of injury, where there is evidence of nerve roots being torn or otherwise severely damaged, the prognosis is not so good.

Paralysis of the extensors of the wrist is well known in relation to chronic lead poisoning. In chronic lead poisoning the muscles most frequently involved are the extensors of the wrist and of the fingers, while the supinator longus almost invariably escapes. The flexors of the wrist and hand are not usually affected, but the grasp will naturally be weakened, owing to the lack of fixation of the wrist on the part of the extensors. If the lesion in these cases be accepted as one of a peripheral nerve, it is not very easy to explain the constant escape of the supinator longus, which, like those muscles which are affected, is supplied by the musculo-spiral nerve; but if, on the other hand, the primary lesion is in the anterior cornua, the explanation will be more easy, since we should then expect to have the paralysis distributed according to the distribution of the nerve roots rather than that of the peripheral nerves. The supinator longus is supplied by the fifth cervical root, and belongs to the same group as the biceps and deltoid, while the extensions of the wrist get their nerve fibres from the seventh root. Thus, if the lesion is a root one, chiefly affecting the fibres of the seventh root or the cells which supply them, we should naturally expect the supinator longus to escape.

The above distribution of lead paralysis is not, however, by any means the only one. In some cases the paralysis begins in the deltoid, and in others the small muscles of the hand are first affected. The last-mentioned group is very important, since it is liable to be confused with progressive muscular atrophy, if the possibilities of lead are not borne in mind. Spasm of the muscles of the hand has been occasionally met with as an effect of lead. Sir William Gowers records a case which came under his notice, and quotes another observed by Eisenlohr.

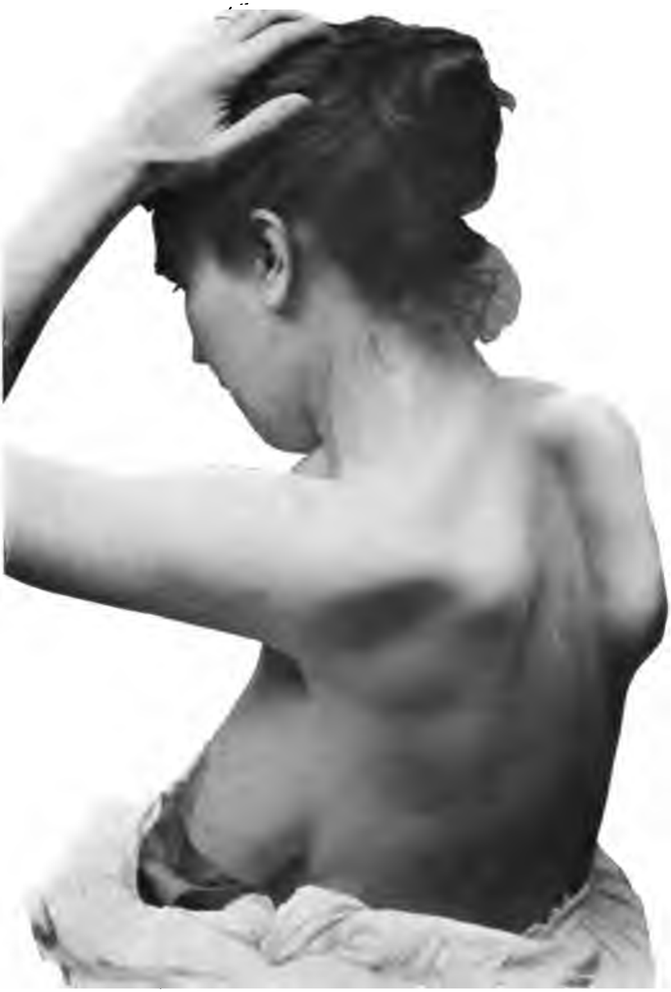
An interesting case in this connection recently came under my care at the Middlesex Hospital.

Case.—The patient was a man, æt. 34, and had been a painter for four years. For two months before his illness, he had only been working with lead for about one or two days a fortnight, the rest of the time having been occupied in varnishing, at which he had been working daily for very long hours—about fifteen hours a day. Three weeks before he came to me, *i.e.* while engaged in this heavy work, he began to feel some pain in his right hand every night after he got home, and this became so bad that it frequently prevented sleep. He described the pains as cramping pains, which drew his hand up.

The condition got worse, and within a fortnight from the onset of the pain, the fingers became set. There was no swelling of joints.

There was a spasm of the flexors of the fingers, which any attempt to overcome gave great pain. The electrical excitability of the flexors appeared to be increased, otherwise no definite changes were made out. Under treatment, which consisted of rest, gentle massage, and galvanism, improvement gradually took place, and in three weeks' time his hand was quite well.

This case can hardly be looked upon as being directly due to lead, but probably it was a factor in the case, the other chief cause being fatigue, from the varnishing for long hours at a time. It should be said that the man had never suffered from colic nor could any "blue line" be detected on the gums. Another common cause of paralysis of the extensors of the wrist is pressure brought about by lying on the arm during sleep; such cases are most often



Paralysis of Serratus Magnus, showing rotation and projection of scapula on raising the arm.

seen where the sleep has been very deep as the result of alcohol or other narcotics. Pressure on the musculo-spiral nerve occurs, and the result is seen in loss of power of extension of the wrist and fingers. The supinator longus, unlike lead poisoning, suffers with the rest of the muscles, and the triceps is also frequently weakened. A diagnosis is usually easily made from the history, and the prognosis is generally very favourable.

Fig. 1 is taken from a case of wasting of the interossei muscles of the hand, and illustrates well the hollow produced at the side of the first metacarpal bone by the disappearance of the first interosseous or abductor indicis muscle.

In this case the paralysis was due to an injury to the ulnar nerve, which is the most common cause. The result of the interosseous wasting leads to important deformities, owing to contraction of unopposed muscles. Over-extension of the metacarpo-phalangeal joints, with flexion of the joints beyond, takes place, and leads to the formation of the "claw hand." The ring and little fingers always suffer most, the deformity of the first and second fingers being largely prevented by the two outer lumbrical muscles which are supplied by the median nerve.

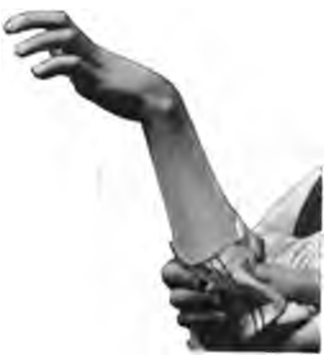


Fig. 1.—Injury to ulnar nerve.

Fig. 2 is an example of the condition known as ischæmic paralysis, also known as Volkmann's paralysis, and is from a photograph of a case under my care at the hospital. The disease is characterised by a contraction of the forearm muscles, which causes contraction of the fingers and sometimes also of the wrist. With the wrist flexed, so that there is no tension on the contracted muscles, the fingers can often be extended, but, as soon as the wrist is extended, the fingers assume the position in the illustration, the metacarpo-phalangeal joints being extended, and the phalanges flexed, more or less strongly, according to the severity of the case.

The affection usually arises during treatment for fractures in the region of the elbow-joint, and was called ischæmic from the idea that it was due to anæmia of the muscles, brought about by pressure of splints. Though the disease has long been known, it has only recently received any marked attention, and at present there are several points connected with it which require clearing up.

In the first place, it is not quite clear how the paralysis is produced, as there is reason to believe that it may not be such a simple process as that of ischæmia.

Again, there are variations in the records of the electrical reactions. Mr. L. Dudgeon,[1] in a recent article on the subject, found the reactions normal in all the cases which had come under his notice, while in the cases he collected from literature the opposite condition was the more common. Dr. Wilfred Harris, who examined a case recorded by Mr. Page, found reaction of degeneration present, and suggested that the end plates of the nerves had suffered as well as the muscles.

Lastly, there is a difference of opinion as to the prognosis of these cases. Volkmann considered it bad, but from recent cases it appears that that view requires modification. Mr. Dudgeon's four cases all ended in recovery, with treatment by electricity and massage; but in others, surgical operations, with a view to lengthening the tendons, have been required.

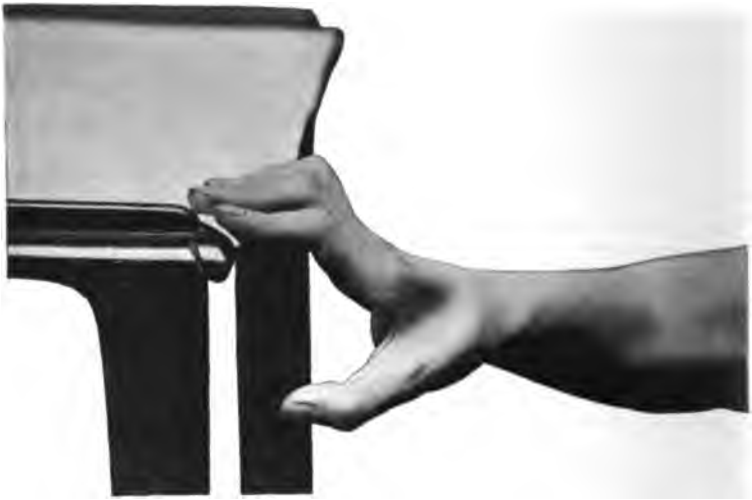


FIG. 2.—Volkmann's contracture, showing the deformity still remaining on extension of the wrist.

The result of the case illustrated in the figure has been in accord with those recorded by Mr. Dudgeon, for there has been no reaction of degeneration, and great progress towards recovery has been made. When I first saw the patient, the fingers were flexed, and resisted any attempt to extend them, while now with the wrist flexed they can be extended without any deformity, and with the wrist extended there is only the amount of deformity seen in the illustration. Probably many of the discrepancies arise through the variation in the degree of paralysis in individual cases, and also through the fact that in many the muscular condition has been further complicated by injury to nerve trunks, which was the case in another instance that came under my notice where the ulnar nerve was also implicated.

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[1] *Lancet*, London, January 11, 1902.

CLINICAL RECORDS.

HÆMORRHAGE INTO THE LEFT FRONTAL LOBE OF THE CEREBRUM.

By S. L. Craigie Mondy, M.R.C.S. (Eng.), L.R.C.P. (Lond.),
London.

Case.—I was called at 3 a.m. on April 7 to see a Mr. L. C. I found him in bed half-dressed. His respirations were very forced, his arms and chest, the alæ nasi, and the frontalis muscle all acting very strongly. His cheeks were not, however, sucked in and puffed out with each inspiration and expiration. His limbs were flaccid, his pupils were contracted, and he was quite unconscious. There was no sign of facial paralysis, and no deviation of the eyeballs. His chest was full of very loud râles, owing to which no definite alteration in the heart sounds could be made out. I was told that he was last seen at 5 p.m. the day before, and that he was then quite well. He had recently been in a hospital with rheumatic fever. There were no signs of external violence. He had been a cellarman. Beside his bed was some vomited matter which smelt very strongly of alcohol. As his heart was acting somewhat irregularly, I gave him a hypodermic of $\frac{1}{60}$ gr. of strychnine sulphate, and remained with him for three-quarters of an hour. His condition remained the same, so I left him, saying I was to be called again if he became worse, or there were any sudden change, and that if not I should see him again in the morning. I was again called to go to him at 11.20 a.m., but just as I was going, ten minutes later, a messenger came to say that he was dead.

I then informed the coroner, who ordered me to make the usual post-mortem examination, and report at the inquest.

Post-mortem examination.—There was some post-mortem staining on the back and legs, but no sign of external violence.

On opening the skull, there was seen through the dura mater, over the entire left lobe of the cerebrum, a dark bluish colour. The right side appeared normal. On removing the dura mater, I found in the left frontal lobe a large, fairly firm clot of dark purple blood, about the size of an orange, and dark blood was spread out over the whole left hemisphere, and also under it. The frontal lobe was torn up, and the blood had escaped through the rent. The wall of the cavity where the clot lay was ragged, and there was a direct communication between the left lateral ventricle and this cavity, which accounted for some free fluid blood in the former. On the right side the vessels of the meninges and brain were slightly congested, but only such as would be expected from the state of the lungs. The large sinuses of the left side were very distended with dark blood. No ruptured vessel could be found in the frontal lobe. The lateral and fourth ventricles contained dark fluid blood, and the choroidal plexus on the left side was filled with dark blue blood. That on the right side was normal. The cerebellum was only slightly congested. There was no fracture of the skull.

The lungs were both slightly adherent to the chest wall at the apices. On section, both were very congested, and exuded blood-stained frothy fluid on squeezing.

On the surface of the heart there was a small patch of old pericarditis. The left ventricle contained a small discoloured ante-mortem clot. Two segments of the aortic valve had recent vegetations on them, but the third was normal. The mitral valve was thickened, but not enlarged. The other valves were normal. There was no atheroma of the aorta. The spleen was enlarged to three times its normal size, and was very engorged with blood. It was otherwise normal in colour and appearance.

The liver was very cirrhotic, and somewhat congested.

The kidneys were congested, slightly enlarged, and appeared fatty on section. The capsules were not adherent.

The stomach contained about 8 oz. of a dark brown fluid, which smelt strongly of alcohol. The intestines contained a small quantity of fluid similar to that in the stomach. The vessels of the stomach and intestines were engorged with darkish blood.

The bladder contained a small quantity of urine.

The curious point in the case was the fact that there was no paralysis or rigidity to lead one to infer hæmorrhage into the cranial cavity.

REVIEWS OF BRITISH AND FOREIGN LITERATURE.

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The Healing of Nerves. By C. A. BALLANCE, F.R.C.S., and PURVES STEWART, M.A., M.D. London: Macmillan & Co. Ltd.

THERE are few more satisfactory pieces of work than a research elaborate and painstaking in its execution, and with a definite clinical object in view.

Mr. Ballance and Dr. Purves Stewart must be congratulated upon the completion of their self-imposed task, and upon the results obtained. The authors do not hesitate to state definitely the opinions formed as the result of their work, namely, that nerves regenerate peripherally and not centrally, and to attack boldly the neurone theory of Waldeyer, which they consider to be at variance with the conclusions they have arrived at.

After a brief statement of the object of the research, a full account is given of numerous experimental divisions of peripheral nerves in dogs, cats, and monkeys; in certain of these cases accurate suturing was at once performed, while in the others the ends were left ununited. The changes, degenerative, but mainly regenerative, are described in both the central and periphera lends of the nerves, after varying lengths of time, from a few hours to several months. Considering that the fullest details are given of the microscopic changes observed, it is to be regretted that an account of the methods of embedding and fixing, and in addition the staining technique, has not been included by the authors, because there is perhaps no tissue whose anatomical and pathological structure can be so altered by " technique" as nerve tissue. Golgi's, Stroebe's, Van Gieson's, and Weigert's methods have been specially employed, and the sketches taken from the specimens are most beautifully executed, though perhaps occasionally they are open to the criticism of being too diagrammatic, and not sufficiently strengthened by micro-photography. The division of the volume into sections, the changes noted in axis cylinders, medullary sheaths, and cellular elements, is useful, and after each section a short résumé of the chief results obtained is given. In a small number of cases the results of nerve lesion and subsequent suture in man is derived from the clinical experience of the writers. The authors find that primary union without degeneration of the peripheral segment does not occur, that degeneration of axis cylinders and nerve fibres is complete in some three weeks, and that after five or six weeks, definite signs of regeneration may be looked for in all cases where there has not been any septic condition present, which might cause permanent destruction of the severed nerve. They agree with the "peripheral" school, that the neurilemma nuclei proliferate, and that these newly-formed cells act in the first instance as phagocytes for the removal of myelin from the old neurilemma sheaths, but are aided and eventually superseded in this task by connective tissue cells, which proliferate and take on phagocytic functions. When so superseded, the young neurilemma cells arrange themselves in columns, and soon after secrete or otherwise develop young axis cylinders, which are at first closely applied to the nuclei, soon become separated, and are at an early date covered by myelin sheaths.

In a considerable number of these experiments the authors introduced a graft, and this they found was in all cases absorbed and invaded from both ends by young neurilemma cells spreading especially along the lines of the vessels. Further, the views expressed, that the newly formed axis cylinders never mature, but remain thin, wavy, and very imperfectly coupled up with the other young axis cylinders to form continuous nerve fibres, until they are joined on to the central end of the divided nerve, agree with those held by the "peripheral" school. They also hold that an amputation neuroma is really formed by the peripheral theory, and that there is no central regeneration either by division of existing nuclei axis cylinders or any other means. As an additional proof of the correctness of the peripheral theory, spider cells with young axis cylinders are shown by the silver method to be present in the peripheral segment. This must suffice for a brief account of the contents of the volume.

It is hardly necessary or possible to offer any criticism here upon the peripheral theory as distinct from the central; it is better to limit our observations to the research in question.

We might be permitted to state, however, that nothing urged by the authors absolutely disproves the central theory; and several of the illustrations in the book appear to point to the central theory of regeneration being supplemented and not superseded by the peripheral. The drawings in question show young nerve fibres inside old neurilemma sheaths; this we have frequently seen, but always in the central end of a divided nerve and never in the peripheral end, and we take it to imply that the young axis cylinders are really in part, if not altogether, divisions of the old central axis cylinders whose neurilemma sheath they now occupy. As if in support of this statement, the sketches from the book under review which show these appearances are all taken from the central ends of divided nerves.

The authors claim that in a degenerated nerve it is always easy to differentiate between neurilemma and connective tissue nuclei, a statement which we cannot by any means endorse. But it is in reality the bold attitude of the authors in taking up the neuroblastic theory which makes the research so interesting and valuable. They do not dispute about the embryological question of whether these neuroblasts are of epiblastic origin or not, but in asserting and proving that the neurilemma nuclei take on the functions of neuroblasts, they have advanced our knowledge by satisfying us that what has been stated by von Büngner and other neurologists as more or less a probability, is indeed a certainty. We have ourselves demonstrated beyond all question the truth of this neuroblastic regeneration in several similar experimental cases.

The clinical importance of work on these lines is very great, and we cannot help regretting that the number of cases of nerve suture in man recorded by the writers is so small. There must be, and we can assert that there is, a very great difference between the nerves of man and other animals, even not excepting monkeys; and the ultimate value of such work, is its bearing on the suturing of divided human nerves, months or even years after the primary lesions, and especially the chance of success to be gained by stranding a healthy nerve, and uniting the peripheral ends of one or more nerves divided by a previous lesion to the healthy central end. How long can we delay? We know that eighteen months or even longer is not the limit, but when is that limit reached?

There must also be degeneration of these young axis cylinders if reunion is never brought about, and it is probable that inflammation at the time of the lesion operates banefully on the peripheral end of the divided nerve. One other question worth mentioning, is the possibility of restoring finer movements, and how far delay renders such restoration of finer movements unlikely of attainment. Kennedy of Glasgow has contributed somewhat to our knowledge of this subject. We have no right to criticise what is outside the scope of the work, but it seems to us that some reference to all of these points would have been desirable.

As already stated, the neurone theory is of necessity attacked, and there is no manner of doubt that this peripheral regeneration theory deals a deathblow to the belief that the cell with all its processes is an entity of which the cell itself is the trophic centre. While most neurologists are willing to admit that there is evidence presented both by experimental research and disease, that a cell process can exist without rapid change, although separated from its cell centre, there are few who will not regret the loss of the convenient and wonderfully simple neurone theory, the creation of Waldeyer; and yet it cannot hold true that the cell with all its processes is a unit, if every axis cylinder process of a cell in a peripheral nerve is made up of a whole host of units, each consisting of the bit of axis cylinder inside its neurilemma sheath, or, in other words, between two nodes of Ranvier.

In conclusion, we must cordially recommend the work published by Messrs. Ballance and Purves Stewart to the attention of surgeons and neurologists, because in it they will find matter for thought, and also some practical assistance in the treatment of nerve injuries.

ROBERT A. FLEMING.

Nothnagel's Encyclopædia of Practical Medicine. "Typhoid Fever and Typhus Fever," by Dr. H. CURSCHMANN. Edited (with additions) by WILLIAM OSLER, M.D. London: W. B. Saunders & Co.

THE excellent series of monographs published in Germany under the supervision of Professor Nothnagel has already made its reputation, and it is not surprising to find it in an English, or rather an American, dress under the general editorship of Professor Stengel. This, the first volume, is composed of the articles on typhoid and typhus fevers by Dr. Curschmann, and an additional value has been given to it by the fact that it has been translated and brought up to date under the care of Professor Osler, who has done so much to stimulate research on the subject of typhoid fever at the Johns Hopkins Hospital. Taken as it stands, we are prepared to accept the book as the first authority on the subject in existence. The laborious work of Dr. Curschmann in collecting an immense amount of statistical material from the most reliable sources, and at the same time from his own valuable observations, cannot be too highly praised, and all the most recent points, relating to bacteriology, inoculation, and so on, have received full justice from the American editor.

The outstanding features of the book are its clearness of language, the completeness of its detail, and the fairness of its judgment on disputed points. It has the advantage of not reading like a translation but like an original work, and the additions to the German text fall easily and naturally into place. The greater part of the volume is naturally taken up by the vast subject of typhoid fever. The bacteriology of the disease is adequately treated. We notice that Remlinger's experiments, undertaken with a view of finding out if typhoid can be given to animals, are treated with due caution, and, as they still lack confirmation, it is in the meantime safer not to accept them, remarkable and interesting as they are. The question of transmission of typhoid germs through the air is also treated cautiously, and the observations of early observers are rightly discredited. But the work of Chour, who discovered bacilli in the dust of a barrack-room, where the disease appeared endemic, is not mentioned, nor is the village epidemic reported by Jeannot as due to dust. Moreover, the conditions with which our troops in South Africa have had to contend, the dust storms emptying the latrines almost on to the men's food, distinctly make aerial transmission at least probable, though it is not necessary to assume the infection takes place by the respiratory passages. The work of Wright and Semple is referred to, and the prospects of inoculation are regarded as promising; its results, moreover, pointing to the fact that immunity in typhoid, as in cholera, is due not to antitoxins but to the elaboration of bactericidal substances in the blood.

Curschmann holds that certain symptoms are to be found present in the incubation period of typhoid fever. He goes so far as to say "that the whole period is as a rule occupied wholly or in part by morbid manifestations." This opens up the difficult question as to what an incubation stage really consists of, for many of us are inclined to doubt if we can accept as a period of incubation a stage which is not a period of true latency, as is the case in the exanthemata. The point is, however, we must admit, of little practical importance. The whole section on "Pathology" is admirably complete. Curschmann seems inclined to doubt the occurrence of true typhoid fever without intestinal lesions, though he admits that apparently authentic cases have been reported; which is certainly the case, and, we may add, with good bacteriological evidence to back them. The fact that fatal cases often show very slight intestinal lesions, corroborates the view that such instances do in reality occur. All the recent bacteriological work on the gall bladder, the spleen, and the urine is noted, as is the work of Keen and others on the larynx and on surgical complications.

The section on "Relapse" is most interesting. Two points are insisted on, that in many cases the spleen remains enlarged during the apyretic interval, and that often interesting fluctuations in the pulse rate are to be noted during the same period. These observations are obviously most important from the point of view of prognosis. Very curious is the chart of a case of "afebrile relapse." As regards the cause of relapses, Curschmann holds that such conditions as mental emotion, premature rising, and dietetic errors, can only be regarded as contributory causes, but he adds, and we cordially agree, that this is not to be taken to mean that the avoidance of such conditions is not desirable. His experience of the fatality of relapses appears to agree with that of most other authors. The ulcerative accidents are not liable to occur, and the death-rate is very low.

As regards treatment, Curschmann thinks that nothing is to be hoped for from antiseptic methods. Those who nowadays use antiseptic drugs are unduly handicapped by the extravagant pretensions of the men who originally introduced them. Without believing for a moment that typhoid can be aborted by calomel, we hold that its use is of great value in the fever, and that Curschmann here underrates its merits. As regards antipyretic methods, the bath is recommended, but with much more caution than its adherents usually display. Indeed, we may question if the full value of hydrotherapeutic methods is to be obtained by the use of lukewarm baths, or baths gradually cooled down to a low level. Curschmann rightly emphasises the fact that the bath treatment is not necessarily an antipyretic treatment, and that its advantages are not merely a lowering of the temperature. If direct antipyresis is required, however, he prefers its use to that of drugs. But when the bath is contra-indicated, he uses quinine if there is any suggestion of hyperpyrexia, and we quite agree that it is probably the best and safest drug. We cannot, however, endorse the use of antipyrin in doses of over 20 grs., frequently repeated, having seen dangerous collapse and cyanosis follow its employment. The section on diet is admirable, and the question of stimulation is thoroughly discussed.

The article on "Typhus Fever" is quite up to the high level of excellence shown by that on "Typhoid." The illustration showing the eruption is, however, not very convincing. An interesting instance of true relapse in typhus, which must be exceedingly rare, is given with a chart. It is interesting to note that Curschmann is very sceptical about the "odour" of typhus which most British physicians firmly believe in. In my own experience I have absolutely no doubt that a definite specific odour exists, and, moreover, that it is of distinct value in diagnosis when noticed. It is, however, very fleeting and evanescent in character. Like most other writers, the author lays great stress on the necessity of allowing plenty of air space in the nursing of typhus, and, indeed, has applied open-air treatment with success. In the narrow limits of a review it is impossible to do justice to the admirable account of the etiology, morbid anatomy, and symptomatology which this article contains. Like that upon typhoid fever, it is a real pleasure to read, and cannot fail to be of great profit to all who are interested in the subject.

The other fever volumes of this *Cyclopædia* being already published or in the press, it is perhaps too late to raise a protest against presenting a book for English readers with all the temperature readings in the Centigrade scale. Even if it was too troublesome to adapt the charts to Fahrenheit's scale, it would seem that on the right hand side of the charts the levels of that scale might have been added. It is not easy to appreciate the course of a fever, displayed pictorially, if the levels have to be calculated by the interested student.

CLAUDE B. KER.

Reports of the Society for the Study of Disease in Children. Vol. i.
London: J. & A. Churchill.

IN little more than a year after the formation of the Society for the Study of Disease in Children, this attractive volume has made its appearance, containing an account of the work done during the first year of the Society's existence. The editors are to be heartily congratulated on the publication of this handsome volume, admirable alike in the variety and interest of the papers contributed, in the excellence of the illustrations, and in the care and expedition with which it has been edited and published.

Dr. Ashby contributes a short article of much interest on "Fœtal Rickets," in which he shows that many of the reported cases of this condition prove, on closer analysis, to be cases of achondroplasia or fœtal myxœdema. The author considers that "fœtal rickets" resembles osteoporosis much more closely than true rickets, the difference between the two being, that in rickets there is a very extensive preparation for ossification, whereas in osteoporosis that preparation is considerably less than in normal conditions, a state of matters analogous to what occurs in fœtal rickets.

Drs. Carpenter and Stephenson have an excellent paper beautifully illustrated with coloured plates on "Tuberculosis of the Choroid." They found this condition present in 50 per cent. of the cases examined by them suffering from acute miliary tuberculosis and from tuberculous meningitis, and they have come to the conclusion as the result of their investigations, that it is not, as is often supposed, a late symptom in these diseases. As a rule, the lesion is of small size, solitary and limited to one eye. It is far from infrequent in chronic tuberculosis, and it is also present in a certain number of cases of quiescent tuberculosis. The views brought forward in this paper are of great practical and diagnostic value, and are not sufficiently recognised.

There is an article by Dr. Caton, reiterating his views with regard to blistering in acute endocarditis; an interesting paper by Dr. Fisher on "Primary Thrombosis of the Cerebral Veins and Sinuses," well worthy of careful perusal, besides many other contributions which the space at our disposal precludes us from even mentioning.

If further Reports bear out the promise of this the first and pioneer volume, the aim of the Society to encourage the exhibition and publication of interesting cases, and to stimulate original research in the domain of the diseases of children, will be amply fulfilled.

G. H. Melville Dunlop.

Artificial Feeding and Food Disorders of Infants. By W. B. Cheadle, M.D. Fifth Edition. London: Smith, Elder, & Co.

Amongst the numerous books on artificial feeding and the food disorders of children which have been published during recent years, Cheadle's well-known treatise still maintains the position which it has long continued to hold, as one of the standard works on the subject. That the necessity for the publication of a fifth edition has arisen, will surprise no one who recognises the sterling merits of the book, or who is familiar with the care and thoroughness which are such striking features of all Dr. Cheadle's work. In the preparation of the present edition, the author has been assisted by Dr. Poynton, who has revised the analyses of the different varieties of milk, and of the various foods so largely used in the feeding of children, and who has added a brief chapter on the symptoms and treatment of acholia. In other respects the book remains as it was; the first, and much the more important portion, is occupied with a consideration of the composition, properties, and preparation of milk, and of the various artificial foods, while the remainder of the volume is devoted to a description of the diseases which result from errors of diet, and their treatment.

The book, which is clearly and forcibly written, carries the conviction to the reader that the views brought forward are the outcome of the author's wide experience and great practical knowledge.

G. H. Melville Dunlop.

Dissection Outline and Index for Students: Adapted for Use with Morris's Anatomy. By William Campbell, B.S., M.D. Second Edition. London: J. and A. Churchill.

The Outline and Index gives under the heading of each dissection a classified list of the various structures to be met with, and after the name of each is given the number of the page or pages in Morris's "Anatomy," upon which may be found a systematic account of the structure in question. In addition to these lists, which form by far the greater part of the book, the work contains, in smaller type, short directions regarding the plan and method of dissection, and in a very few places general descriptions are added, to assist the student in looking for and in recognising the various structures. The directions as regards the method of making the dissections are, in many cases, too condensed. The work would certainly be much strengthened by the addition in other places of general descriptions, such as those given in connection with the dissection of the anterior triangle of the neck (pages 26–32), and taken from Cunningham's "Practical Anatomy." The difficulty of working from a large systematic text-book, such as Morris's, while carrying out the dissection of a region of the human body, is too great a one to be met satisfactorily by such an Outline and Index as that under consideration. The present work will only be of much use to a student who has just made or is about to make a dissection of some part, and who wishes to read up at home in his text-book an account of the various structures he has exposed or is about to dissect out.

A. FRANCIS DIXON.

Human Morphology and Embryology. By ARTHUR KEITH, M.D., F.R.C.S. London: Edward Arnold.

MANY senior medical students, who are preparing for examinations, will be grateful for this series of notes on "Human Morphology and Embryology," which formed, as Dr. Keith states in his preface, the substance of a "course of demonstrations," delivered in the London Hospital Medical School.

The book is divided into twenty chapters, in which the majority of the organs and principal parts of the body are dealt with, each chapter forming a separate section. The descriptions are short, in some cases perhaps too short, for the author expresses his thoughts very clearly, and numerous diagrams emphasise the points to which he directs special attention, therefore the reader's mind readily grasps the facts placed before it, and, even at the expense of making the book a little longer, more space might have been devoted to the discussion of debateable points, which are dismissed, in some cases, with the scant courtesy of short and dogmatic statements, which are open to the objection that they are liable to be misleading, though they may sometimes be valuable from the teacher's point of view.

The book will be the more welcome to the majority of students, because the author treats his subject not only from the descriptive point of view, but also with regard to the abnormalities which may appear in the child or adult, on account of the deviations from the ordinary course of development which sometimes occur during intra-uterine life, and because he directs attention to the relationship which exists between some of these abnormalities and the normal conditions met with in other vertebrates. For these reasons also the book will undoubtedly find favour with the practitioner who wishes for a short and clear explanation of the peculiar and abnormal conditions that he occasionally meets with in his practice.

There is room for difference of opinion with regard to some of the statements which Dr. Keith makes in his descriptions of the phenomena with which he deals, but there is no doubt about the readableness and usefulness of the book which he has produced, and perhaps the most interesting chapters are those dealing with the head, the osseous system, the genito-urinary organs, and the brain.

ARTHUR ROBINSON.

Phototherapy. By Professor Niels R. Finsen, Copenhagen. Translated from the German Edition, and with an Appendix on "The Light Treatment of Lupus," by James H. Sequeira, M.D. London: Edward Arnold. 1901.

Taken together, the three essays which compose this small volume are, in their nature, rather introspective than didactic, though the latter element is by no means neglected. In it Finsen reveals to us the mental processes by which he evolved his "light treatment." The first is a study of the injurious effects of light, and, deduced from an analysis of its components, the important inference is drawn, that if variolous patients are kept throughout the course of the disease in an apartment to which the red beams of the spectrum alone have access, the dangers are all but wholly eliminated, while there is no suppurative stage, and scarring with all the resulting disfiguration does not occur. The statements made have been fully corroborated, and it seems strange that a method, so simple and so successful, appears to have been hitherto almost wholly untried in this country. Yet an abstract from the French edition appeared in these pages in July 1899. The second monograph is an investigation into the stimulant effects of various spectral rays on certain animals in confined spaces, judged by their efforts to escape from or to bask in particular beams, as expressive of their aversion or appreciation. The third is a sketch of the principles which regulate the treatment of lupus vulgaris by concentrated chemical rays. Though supplemented by some remarks by Sequeira, this part cannot be regarded as a complete guide. The book is most fascinating and suggestive, it compels one to think, and its perusal is well worth the time so spent.

W. Allan Jamieson.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
A. LOCKHART GILLESPIE, M.D., F.R.C.P.Ed.,
MEDICAL REGISTRAR, EDINBURGH ROYAL INFIRMARY.

The Supraorbital Reflex.

Von Bechterew, Hudovernig, and M'Carthy, *Centralbl. f. d. med. Wissensch.*, Berlin, Feb. 8, 1902, S. 94.

Von Bechterew calls this the "eye reflex," and looks upon it as of periosteal type, capable of being induced by blows applied to any portion of the frontal and temporal regions of the skull. M'Carthy defines it as a fibrillary tremor of the orbicularis palpebrarum muscle, following the blow of a percussion hammer on the supraorbital nerve. To obtain it the eyes must be open and still. The phenomenon is lost in facial paralysis (cf. below), and after section of the nerve already mentioned. M'Carthy draws especial attention to the fact that here direct stimulation of a sensory nerve can induce motor action.

Hudovernig believes that fibrillary trembling of the orbicularis palpebrarum muscle invariably succeeds forcible percussion of the frontalis muscle; in most cases percussion on only one side produces double-sided results. In facial paralysis, the side affected fails to respond to this; in paresis of the facial nerve, the response to percussion of the frontalis muscle on either side is weak on the side affected. In one instance, notwithstanding antecedent extirpation of the right Gasserian ganglion, with analgesia and anæsthesia of the same half of the face, the reaction could be elicited in equal degree on both sides. The reaction, he holds, is not truly reflex, but only an extension of mechanical stimulation of one muscle to another muscle supplied from the same nerve.

Von Bechterew, on the contrary, found the reflex generally obtainable on both sides, but more pronounced on the side percussed. He describes a mandibular reflex, induced by percussing, from above downwards, the lower jaw, in front of the insertion of the masseter muscle, or the chin (the mouth being held half open), when a sudden drawing of the jaw backwards occurs. This reflex is more marked on the side opposite to the lesion in one-sided cerebral lesions. It it also of importance in differentiation between peripheral and central trigeminal lesions. A nasal reflex also exists, which depends on the wrinkling of the nose and contraction of the adjoining parts of the cheeks when the deeper portions of the nasal mucous membrane are stimulated. Usually single, in lesions of the fifth and seventh nerves it is absent. In some cases of trigeminal neuralgia, however, it is more marked.

THE PATELLAR TENDON REFLEX IN CHOREA.

Eshner, *Phila. Med. Journ.*, June 8, 1901; M. C. Oddo, *Gaz. d. hôp.*, Paris, 1901, No. 124; G. Oddo, *Rev. de méd.*, Paris, 1901, tome xvi. (1, 2), pp. 27, 138.

M. C. ODDO was only able to elicit patellar reflexes of normal type in fourteen out of 147 cases of chorea; in 28, the reflex was normal on one side; abnormal, increased, or diminished on the other; in the last class of case, the symptoms of chorea and the abnormal character of the reflex action were present on the same side. In seventy-five out of 116, the knee-jerk on both sides was feeble; unilateral in forty-one.

In thirty-eight instances only could a more than usually marked knee-jerk be elicited. The variations of the patellar reflex were generally repeated in the tendo Achillis reaction. The loss of muscular tonicity had no relation to these variations.

Eshner has investigated the statement of Gordon, originally published in the *British Medical Journal*, concerning a peculiarity asserted by him to characterise some, not all, cases of chorea, but which, when present, is pathognomonic. When the patient suffering from chorea lies on his back with the knees bent and the heels on the bed, if a leg be raised up, the tendon between the patellar and the bones tapped, the foot is dorsiflexed, slowly returning to its former position, after a shorter or longer period of sustained dorsiflexion. Eshner corroborates Gordon; is at one with him as to the inconstancy of the phenomenon; finds that it only obtains on the affected side in hemichorea; and regards it as due to an intensification of the choreic tendency. Spasmodic tic and athetoid movements may simulate chorea; in the first the knee-jerks are unaltered, in the second increased; in chorea variable; but it is only from cases of the last that the phenomena described above can be obtained.

G. Oddo, in a paper dealing with the localisation of the symptoms of chorea, says of the tendon reflexes that they may be normal, feeble, or absent in chorea. In seventy-five out of 112 cases, or nearly 67 per cent., they were absent.

The tendon reflexes may be found to be abnormal on one or on both sides in one-sided, or largely one-sided, cases of chorea; they never are abnormal on one side only in chorea, where the movements are equally marked on both sides. It is seldom that the tendon reflexes are increased on one side, diminished on the other.—See also Todeschi, *Gazz. d. Osp.*, Genova, 1901, Nos. 125–128.

SURGERY.

UNDER THE CHARGE OF

ALEXANDER MILES, M.D., F.R.C.S.Ed.,

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Wounds of the Heart.

Within the last two years Fontan has operated successfully in two cases of wound of the heart. These cases were reported to the Académie de Médecine by M. le Dentu, who has collected all the cases recorded up to date. Fontan's first patient was a soldier, who stabbed himself several times in the region of the heart. One of the wounds penetrated the left ventricle, 1½ in. above the apex. The wound of the heart was complicated by pneumothorax and subcutaneous emphysema. The operation was performed six and a half hours after injury. The patient recovered, and resumed his military duties. The other patient, also a soldier, was stabbed below the left nipple in a brawl. When Fontan saw him two hours later, he presented all the signs of severe loss of blood. The pulse was small and rapid (130), the respirations 40, the temperature about 96° F. In this case also there was pneumothorax. The operation was undertaken two hours after the injury. For six days progress was satisfactory. Then the patient developed a *right*-sided pneumonia, attributed to an embolic infarction, followed by empyema, which was treated by pleurotomy. A month later a pyæmic abscess developed in the right calf. The patient eventually recovered, and rejoined his regiment.

The operative procedure was the same in both cases. A rectangular flap, with its base externally, was thrown down, and the cartilages of the fourth, fifth, and sixth ribs divided a short distance from the sternum. The flap included the pleura. The pericardium was opened, the apex of the heart seized with Kocher's forceps and pulled towards the surface. In each case it was observed that the wound in the heart increased, and a jet of blood escaped with the systole of the heart. The edges of the wound were brought together by catgut stitches inserted with a fine Hagedorn needle. In one case a stitch was accidentally passed through the whole thickness of the wall of the ventricle, and with each systole a fine jet of blood was projected from the needle punctures. After the wound in the heart had been closed, the clots were removed from the pericardial sac, the pericardium closed, the flap replaced, the cartilages sutured in position, and the external wound closed without drainage.

Le Dentu has collected thirty-eight cases in which wounds of the heart have been treated surgically, with the following results:—

1 case.—Isolated wound of vessels of the heart. (Ligatured.) Cure.
4 cases.—Non-penetrating wounds (or penetration doubtful). (Sutured.) Cured.
29 cases.—Penetrating wounds (for the most part sutured). 8 cures. 21 deaths.
4 cases.—Wound in pericardium plugged. 3 cures. 1 death.

Out of thirty-eight cases, sixteen recovered, *i.e.* about 42 per cent. Nietert has estimated that without operation not more than 10 per cent. recover.—*Bull. Acad. de méd.*, Paris, Mar. 18, 1902.

TEMPORARY OCCLUSION OF THE CAROTID ARTERIES.

WITH a view to diminishing the risks of severe hæmorrhage in extensive operations on the head and neck, without at the same time incurring those incident to ligature of the carotid vessels, Crile of Cleveland has devised a method of temporarily occluding the main arteries of supply to the region operated on. A clamp, similar in design to that used by Makins for the intestine, is employed. One blade is a little longer than the other, and its end is slightly turned up to prevent the artery slipping out of the instrument. The blades are covered with rubber tubing, and are adjusted by means of a set screw. From experimental observations on dogs, Crile has satisfied himself that a properly adjusted clamp can be left in position, closing the artery from twenty-four to forty-eight hours, without serious injury to the walls, and that on removing the clamp the circulation through the clamped portion is readily re-established. In none of the experimental cases was there clotting, and in no case were emboli or thrombi found in the brain on post-mortem examination.

He has employed this method of controlling hæmorrhage clinically in eighteen patients, involving the occlusion of twenty-eight individual arteries. Both common carotids were closed in ten, one common carotid in five, and one external carotid in three patients. Twenty minutes before the operation, $\frac{1}{100}$ gr. of atropine is injected, to prevent possible inhibitory action on the heart from irritation of the vagi or superior laryngeal nerves. The patient is placed in the Trendelenburg position, which partly compensates for the lowered cerebral blood pressure resulting from closing the carotids. Before removing the clamps, he should be returned to the horizontal. The conditions for which the operations were being performed included the removal of a large fibrosarcoma from the roof of the mouth, the removal of a congenital tumour of the neck, several resections of the tongue with glands, excisions of the jaws, tumours of the parotid, cavernous angioma of the orbit, etc. The ages of the patients ranged from 7 months to 69 years. There were no deaths attributable to the temporary closure of the arteries. In every instance the circulation was resumed immediately upon releasing the clamps, and there were no ill effects on the vessel wall, the circulation in the closed arteries or their branches, or upon the brain. The author claims that less anæsthetic is required, the duration of the operation is shortened, and the loss of blood is of course much diminished.—*Ann. Surg.*, Philadelphia, April 1902.

CONGENITAL DISLOCATION OF THE PATELLA.

ZESAS has collected sixty-four cases of congenital dislocation of the patella, and in the paper before us he gives a brief résumé of each of them. Sixty-one are examples of dislocation outwards, three of dislocation upwards. These statistics show that, contrary to the general statement, the outward dislocation is more common in males than in females (thirty-seven males to twenty females). Of the unilateral cases, fourteen were on the right side and fourteen on the left. In thirty-one cases the dislocation was bilateral. In sixteen cases it was intermittent; thirteen being complete, and three incomplete. In forty it was permanent; twenty-nine complete, and eleven incomplete. Heredity appears to play an important part in the pathology of the condition, and several cases are quoted in which several members of a family suffered. In one case, for example, the grandfather, the father, the brother, the sister, and a child of the patient, were all affected. The most constant anatomical abnormality is an imperfect development, sometimes amounting to entire absence, of the external condyle of the femur, and this appears to be congenital in origin. In some cases the intercondyloid fossa appears to have been abnormally flat, but this may have been a consequence and not a cause of the deformity. The external condyle was normal in only three of the cases. Genu valgum does not appear to be more than a predisposing cause; by some it is even looked upon as a consequence.

The diagnosis is easily established by careful manipulation of the joint. The quadriceps muscle is almost always more or less atrophied, and the functional disturbances vary accordingly. They consist chiefly in impaired movement, instability of the joint, and weakness, so that the patient is easily fatigued. The patient has always some difficulty in climbing a stair.

Little benefit is derived from the wearing of apparatus designed to retain the patella in position, or from treatment by massage, electricity, or douching, directed towards the weak muscles. The best results have been obtained by operative treatment. The procedure adopted depends upon the nature of the defect in the bones and the extent of the deformity. The choice lies between suturing the aponeurosis of the quadriceps on the inner aspect of the knee, dividing the aponeurosis on the outer aspect, deepening the intercondyloid fossa, and transplanting the tubercle of the tibia with the ligamentum patella attached towards the internal tuberosity of the tibia. These procedures may of course be combined. In some cases the removal of the patella has been followed by satisfactory results.—*Rev. de chir.*, Paris, March and April 1902.

SURGICAL TREATMENT OF DISEASES OF THE STOMACH.

HUBER gives an analysis of sixty-two cases of disease of the stomach which he has transferred to surgeons for treatment. The number is made up of thirty-four cases of carcinoma, twenty-three of simple stenosis of the pylorus, two of stenosis due to conditions outside the stomach itself, two of perforated gastric ulcer, and one of gastroptosis. In twenty-six of the cases of malignant disease a palpable tumour was present. In all the cases there was motor insufficiency of the stomach, as tested by washing out the stomach a definite time after a test meal, and examining the washings. Free hydrochloric acid was absent in twenty-five cases. Lactic acid was present in twenty-two of thirty cases examined for it.

Huber considers that motor insufficiency, absence of free HCl, and presence of lactic acid, together constitute a triad of signs which indicates, almost certainly, the presence of malignant disease, and which is of great diagnostic value when there is no tumour palpable.

In nine of the cases of carcinoma, resection of the tumour was performed, with an immediate mortality of 11 per cent. This Huber regards as an unusually favourable result, the average mortality being much higher, varying with different operators from 15·6 to 38 per cent. The longest survival after the operation was two and a quarter years. According to the larger statistics of Mikulicz, radical cure may be expected in 17 per cent. of cases operated on. Gastro-enterostomy was the operation performed in the remaining twenty-five cases. The mortality was 24 per cent., and this also Huber considers an unusually favourable result. He holds, with Kuttner, that operation is indicated in cases of pyloric cancer, of cancer of the anterior and posterior walls, where, as far as can be ascertained, there is no involvement of neighbouring organs, and in all tumours causing severe disturbance of the gastric functions, especially those with symptoms of stenosis. Patients with cancer of the cardiac end of the stomach, Huber hands over to the surgeon only when the patients themselves urgently desire operation. Their sufferings, he believes, can be better alleviated by the physician than by the surgeon.

In the twenty-three cases of simple stenosis of the pylorus, gastro-enterostomy was performed twenty-one times, pyloroplasty and gastrolysis each once. Five patients died from the effects of operation, a percentage of 21·7. Huber reckons that the average immediate mortality may be estimated at not less than 20 per cent. In the remaining cases of stenosis the result was uniformly good. Gastric ulcer was responsible for the condition in twenty-two of the twenty-three cases.

Huber advises operation in such cases when careful dieting and regular lavage fail to relieve the symptoms. He finds that exact indications for operative interference are difficult to lay down, as in some cases the patient's social position, in others his unwillingness to abstain from the pleasures of the table, prevent proper treatment being carried out.—*Cor.-Bl. f. schweiz. Aertze*, Basel, March 1902.

OBSTETRICS AND GYNÆCOLOGY.

UNDER THE CHARGE OF

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Radical Operation in Carcinoma of Uterus.

Wertheim (*Arch. f. Gynaek.*, Berlin, Bd. lxv.) reports thirty-one cases where the parametric tissue and pelvic glands were removed with the uterus, in order if possible to improve the permanent results of operation.

The condition of the primary growth, its mode of extension, and glands involved, is in each case represented by a diagram.

Wertheim describes his operation as follows—(1) Incision from above symphysis to umbilicus—fundus drawn well forwards with volsellum forceps; appendages pulled laterally so as to expose the ureters, which can be distinctly seen through the peritoneum. Previous sounding of the ureters he regards as unnecessary, and may even do harm on account of the length of time the catheter may require to be kept in. Wertheim ascertains the course of the ducts by palpation, and then splits the peritoneum covering them. (2) The uterus is drawn well up towards the umbilicus, the bladder separated from the cervix, and ligaments divided. (3) The finger is pushed through the parametrium on each side, as far down as the point where the ureter enters the bladder, uterine artery ligatured, and the ureter exposed throughout its entire course. (4) Uterus drawn well forwards towards the symphysis, so as to put the utero-sacral ligaments on the stretch, and which are divided as near the posterior pelvic wall as possible. (5) The bladder is further separated from the vagina, which is pulled up and clamped with elbowed forceps. (6) Vaginal canal divided as low down as possible. (7) Large iliac vessels exposed, and any infected glands removed. (8) Peritoneum covering the bladder is sutured to that on the posterior pelvic wall. The ureters and vessels being thus covered, the subperitoneal cavity is drained with gauze.

The extirpation of the smaller glands Wertheim does not think necessary, as they are generally unaffected and their removal unnecessarily prolongs the operation. In his first series of twenty-nine cases, so treated, twelve died from the operation. In this later series there were only five deaths—intestinal obstruction, two; tuberculosis, one; shock, one; pyonephritis, one.

In no case was the ureter directly injured during the operation. Although five of the sixty cases had a uretero-vaginal fistula, probably the result of necrosis of the wall of the duct, from disturbance of its vascular supply, examination of the extirpated glands showed that they were affected relatively early in most of the cases. In about 31 per cent. the glands were distinctly cancerous, in 15 per cent. the glandular infection was only beginning. The cases are too recent to permit of any conclusions regarding the permanent result. A series of photographs illustrate the steps of Wertheim's operation.

IS VAGINAL EXTIRPATION SUFFICIENT IN CARCINOMA OF THE UTERUS?

WINTER (*Ztschr. f. Geburtsh. u. Gynäk.*, Stuttgart, Bd. xliii.) states that of 300 cases of carcinoma of the cervix operated on previous to 1892, 30 per cent. were free of recurrence five years after operation. Those cases, he claims, are cures. Of thirty cases of cancer of the body, 53 per cent. were cured. Of all cases presenting themselves, 28·7 per cent. were operated on by vaginal extirpation, and of those 33 per cent. were cured according to the five years test. More recently, about 48 per cent. of all cases have been found operable, so that from 15 to 20 per cent. of cases may be cured. Those encouraging results are in all probability in some measure due to the cases presenting themselves at hospital much earlier in Germany than they do in this country.

ON THE PERMANENT RESULTS OF OPERATION FOR CARCINOMA UTERI.

PFANNENSTEIL (*Centralbl. f. Gynäk.*, Leipzig, 1901, No 15) states that of all cases of malignant disease of the uterus, presenting themselves at hospital, 19·5 per cent. have been treated by vaginal hysterectomy. At the end of five years, 36·2 per cent. of those followed (47 of 116) were free from recurrence, which is equal to 15 per cent. of all cases operated on, and 7 per cent. of all cases presenting themselves for treatment. Pfannensteil favours vaginal hysterectomy, and resorts to the abdominal operation in exceptional cases only.

CHANGES IN THE BLADDER ASSOCIATED WITH CARCINOMA OF THE CERVIX.

ZANGEMEISTER (*Arch. f. Gynaek.*, Berlin, Bd. lxiii.) refers to Winter's investigations on this subject, from a collection of forty-three cases. He found foldings of the bladder wall, swellings of its mucous lining, but relatively seldom cancer of the bladder itself. Zangemeister examined both operable and inoperable cases with the cystoscope. When the disease was confined to the cervix, the floor of the bladder was simply pushed mechanically forwards, and where extension had taken place towards the vesico-vaginal septum the wall was thrown into folds. Retraction of the paravesical connective tissue he found the chief cause of lateral distension of the ureter and rotation of the trigone to the side and front. As the disease advances, circulatory changes occur in the bladder wall—venous stasis, œdema and hæmorrhages, the latter being mostly punctiform. The œdema is peculiar in taking on the form of small red, bleb-like elevations, termed by Kolisker "bullous œdema," a condition also occasionally met with in inflammatory changes in the neighbourhood of the bladder, *e.g.*, pyosalpinx. The ureteric openings are placed on small elevations of the mucous lining, and the urine is expelled more forcibly and at longer intervals, probably the result of increase of its lumen and muscular hypertrophy. In the inoperable cases papillary outgrowths are seen on the bladder wall, resembling condylomata, ulcers are observed later, and cystitis and hæmorrhage only when the disease involves the wall. The ureters are the last affected. Zangemeister made those observations with the view of showing that cystoscopic examination may be of some use in ascertaining the degree of extension of the cancerous disease, and deciding on the suitability of the case for operation.

PELVIC CARCINOMA ASSOCIATED WITH MALIGNANT DISEASE OF ABDOMINAL ORGANS.

ROMER (*Arch. f. Gynaek.*, Berlin, Bd. lxvi.) writes on apparently primary but in reality metastatic carcinoma of the ovaries, associated with malignant disease of other abdominal organs. He refers to cases of multiple primary carcinomes, reported by Bucher and others, and the rarer condition of multiple primary sarcoma. He quotes a case of carcinoma of the pylorus, with glandular affection, associated with double fibro-sarcoma of the ovary, and Temesvary collected three hundred cases of ovarian sarcoma (bilateral), in four of which there was also malignant disease of the intestinal tract. He further describes many published cases, demonstrating the frequency with which carcinoma of the stomach is associated with a similar condition of the ovaries, showing, as Pfannensteil has pointed out, the general disposition there is in some individuals to multiple tumour growth, and that all such cases are not to be regarded as metastasis, but two primary cancers occurring at the same time. Primary carcinoma of the ovary forms about 22·4 per cent. of all solid tumours of that organ, whereas metastatic cancer is much rarer. Of 220 mammary cancers, the ovaries were affected in twenty-six, and it occurs most frequently secondary to carcinoma of the stomach. Borrman found in seventy such cases the ovaries affected twice, and Romer describes in detail two cases under his own observation. He refers to the possibility of the ovaries becoming affected by cancer cells being carried in the peritoneal fluid on to their surfaces, and breaking down the superficial epithelial cells, rather than infection through the lymph and blood channels. He describes a case where, a year after double ovariotomy for solid tumour, the patient died from carcinoma of the stomach; and from this and other reported cases he advises that, when operating on an apparently uncomplicated ovarian cyst, the condition of the abdominal organs, especially the stomach, should be noted.

THE VAGINAL OR ABDOMINAL ROUTE IN THE SURGICAL TREATMENT OF UTERINE FIBROIDS.

MARTIN (*Centralbl. f. Gynäk.*, Leipzig, 1902, No. 14) finds that of 200 cases treated by operation, in 24 per cent. the tumours removed could not be regarded as innocent. He advocates widening the indications for operation, when the general health is impaired and the power of working diminished. The earlier the operation the greater is the chance of saving the uterus, an important factor in young patients, and also advisable in patients past the child-bearing period. Vaginal operations give a better immediate result than those performed by the abdominal route, although technically they are more difficult, on account of the limited space to work in. Martin, however, finds that hæmorrhage and the treatment of the pedicles can be quite satisfactorily treated per vaginam, and if any great difficulty arises during the operation, hæmorrhage may be checked through an abdominal incision. Of 1000 cases of colpotomy, in two cases only has he had to resort to the abdominal route. He removes large fibroids through the vagina, provided they can be pushed down into the pelvis by suprapubic pressure, or can be reduced in size by *morcellement*. The abdominal operation is to be preferred where there is an inflammatory history, probably causing intestinal and omental adhesions. Martin points out that the bladder wall is frequently in a condition of œdematous softening, rendering it more liable to injury during operation. He has never injured the ureter in any vaginal operation. Schuchard's perineo-vaginal incisions are of great advantage in removing large fibroids through the vagina. Martin prefers enucleation, when possible. In three years he operated on 118 cases—eighty-seven vaginal, thirty-one abdominal; of the latter, twenty-six were total extirpations, with five deaths; five enucleations, with one death. Of the fatal cases, three were complicated with pyosalpinx, one with carcinoma of the uterus; in one, the ureter was injured; in one, infection from an abdominal uterine fistula. Of the eighty-seven vaginal operations, thirty-five were total extirpations with no deaths; fifty-two enucleations, with two deaths from infection.

THERAPEUTICS.

UNDER THE CHARGE OF

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Drugs which Prevent Tissue Waste.

Soulier recognises three great classes. The first is of purely physiological interest, and deals simply with the relative nutritive value of the various kinds of foods. The next class, antidestroyers, diminish the tissue waste by lessening oxidation and molecular changes. This class only act when oxidation and molecular processes are abnormally active. To the third class, which act by causing better utilisation of the reserve food stores of the body, Soulier would restrict the term tissue savers. This class includes kola nut, caffeine, and coco leaves. The drugs are closely related to one another, and to the xanthin derivatives of digestion. Unlike the antidestroyers, which diminish metabolism, these tissue savers are stimulants leading to increased excretion of nitrogen in the urine. This increase is due to the fact that these drugs lead to the better utilisation of the reserve food-stuffs. The carbohydrates, fats, and circulating albumin are more efficiently utilised, and the fixed tissue albumin is protected at their expense. Under their influence the reserve stores are used with the greatest efficiency and economy. Experiments with the ergograph show that these drugs, with the exception of kola nuts, do not increase the resistance of the organism to fatigue. Kola nuts do lessen fatigue. The best means of using the drugs is by frequent administration of small doses, as the stimulant action passes off quickly. The most useful member of the group is kola nut. It allows the maximum utilisation of the reserve store, so that, for a time, intellectual and physical work can be accomplished on an insufficient diet. Morel and Flach have discovered that the urinary nitrogen is increased, but urea diminished, after kola nut. This, they hold, is due to the presence of tannin, which as an antidestroyer diminishes oxidation. The action of caffeine, tea, and coffee is less marked but similar. Soulier claims that arsenic, especially in the form of cacodylates, belongs more to the class of tissue savers than antidestroyers. As an alternate oxidising and deoxidising agent, it acts as a catalytic ferment, increasing tissue change.—*Lyon. méd.*, March 30, 1902.

PITUITARY GLAND IN ACROMEGALY.

KUH points out that in all cases of acromegaly, changes in the pituitary bodies have been discovered. In the few apparently exceptional cases the diagnosis was doubtful. Probably the hypophysis exerts an influence on the growth of the body. In three cases of acromegaly Kuh has tried the effect of feeding with powdered pituitary bodies. In the first case, that of a Jew, æt. 29, the disease seemed to be slowly progressing. In this case the pituitary treatment did not seem to have much beneficial action, though, whenever the powders were stopped, he complained that his headache became more intense. It seems also as if the mental depression was slightly diminished by the treatment. In another case, that of a Swede, in whom the symptoms had been of gradual onset, there was given 5 grs. of powdered pituitary bodies thrice daily. She steadily improved during a year and a half, and was able to resume her work. Afterwards she relapsed, suffering from severe cramps in the legs, and becoming very depressed. During the last eighteen months there was no change in the objective signs. In the last case the powdered gland relieved headache, vertigo, and hyperidrosis. After a year's improved health he died suddenly. Kuh holds that in two of the cases the treatment was distinctly beneficial. The organic changes were, of course, not removed, but the subjective symptoms were relieved.—*Journ. Med. Ass.*, Chicago, 1st February 1902.

ARRHENAL.

GAUTIER gives this name to a new organic preparation of arsenic, sodium methylarseniate. He suggests that it is safer than, and can be used to replace, the cacodylates. If the cacodylates be given for a long time by the mouth, they are apt to undergo partial reduction, giving rise to a poisonous substance with an alliaceous odour, which weakens the patient, and gives rise to dyspepsia and irritation of the kidneys. The cacodylates can only be safely administered hypodermically in chronic diseases. Consequently Gautier tried to discover a less poisonous compound. Arrhenal is obtained by the action of methyl-iodide on sodium arsenite in the presence of excess of alkali. It is a colourless crystalline salt, very soluble in water, of an alkaline taste and reaction. It contains 31 per cent., by weight, of metallic arsenic = 45 per cent. of arsenious acid. The therapeutic dose is about 5 cgrms. per diem. It can either be administered by the mouth or hypodermically. The chief advantage of the new preparation is, that it can be given for long periods by the mouth without causing indigestion, eructations, or renal congestion. In therapeutic doses, the medicine is excellently tolerated. The appetite increases, blood pressure rises, and the patient increases in strength and weight. It is better tolerated and is more powerful in action than the cacodylates. The most generally useful dose is about 0·77 gr. per diem. It should be given for four or five days at a time, and then stopped for a like number of days. In this way it can be kept up for months without any poisonous effects. The red blood corpuscles rapidly increase in number, and the hæmoglobin rises. The total urinary solids increase, but the large increase in the urea shows that the proteid metabolism is rendered more efficient. In some cases, when the ratio of urea to total urinary nitrogen is diminished, it seems possible that the stimulation of the appetite has led to more proteid being ingested than the tissues can utilise. Under the influence of the drug, the amount of CO_2 exhaled diminishes, so that the ratio $\frac{CO_2}{O}$ approaches the normal value of 0·83. While under arsenical treatment, the phthisical patient consumes more meat, the total quantity of CO_2 produced and of O absorbed by the lungs diminishes, while at the same time the quantity of CO_2 exhaled for O is increased, showing that oxidation is more efficient. In therapeutic doses arsenic increases rapidly, the large white mononuclear corpuscles of the blood, either by a true increase in number, or by a positive chemiotaxis, acting on those already formed. These corpuscles remove the noxious material of nitrogenous or carbohydrate metabolism, or else oxidise them. At the same time the large increase in the red corpuscles brings more oxygen to the tissue, and makes metabolism more complete. The increase in these two kinds of corpuscles is directly due to the absorption of arrhenal, which, owing to its easy administration and controlability, is likely to prove a most useful drug. Gautier has already used it with great success in phthisis (both in the early and late stages), in chorea, malaria, pernicious anæmia, syphilis, and skin disease.—*Bull. Acad. de méd.*, Paris, 25th February 1902.

Cocaine and Eucaine.

Crile has investigated the action on dogs. Injection of cocaine into a nerve trunk leads to a physiological block, so that neither afferent nor efferent impulses can be transmitted. The interruption is as complete as if the nerve had been divided. General anæsthesia prevents apprehension of pain, but does not block other afferent impulses, caused by mechanical, thermal, or electrical stimulation. Thus, under general anæsthesia, if the paw be burnt there is still reflex muscular contraction. This does not occur if the nerve be blocked with cocaine. After the effect passes off there is no neuritis or degeneration. Apparently the action is temporary suspension of functional activity. The blocking is complete for voluntary movements and for electrical stimulation. Similarly, if injected into the spinal cord, blocking is effected, but here there is slight structural alteration, shown by cellular infiltration. When applied to the surface of the medulla or fourth ventricle, there is general anæsthesia, loss of power of motion, and rapid failure of respiration from paralysis of the centre. The respirations cease in 30 seconds, while there is profound depression of blood pressure. External stimuli have no reflex power of affecting the blood pressure. Cocaine acts more promptly than eucaine. Even after death of the animal, cocaine injected into nerve can prevent electrical stimuli passing. On the circulatory apparatus the effect of cocaine intravenously is an immediate but transient rise of pressure, followed by a slight fall. Later a gradual rise occurs. The inhibitory influence of the vagus is partially or wholly suspended. The vasomotor reflexes are considerably diminished. The circulatory apparatus is less responsive to stimulation. The vessels of the splanchnic area are contracted. There is increased tendency to clotting. On the respiration small doses act as stimulants. Medium doses diminish the amplitude, while large doses abolish respiration. Subarachnoid injections cause immediate fall in blood pressure, and loss of thermal, mechanical, or electrical reflex from parts below level of injection. The respirations were increased, unless the drug reached the medulla, when they ceased. Experiments with a cocaine solution in methylene-blue showed that the diffusion was extremely rapid. An injection of 30 minims in the lumbar region stained the whole cord and under surface of the brain within thirty seconds. Normal saline injections caused no paralysis. There is no means of controlling the extent of anæsthesia produced by subarachnoid injection. The mortality rate is fifty times that of chloroform. Crile shows how these results can be used clinically to abolish shock. Anæsthesia can easily be produced by injecting cocaine into the nerves. This prevents pain and shock. Next day there is often a moderate burning sensation in the nerves. The block lasts from twenty-five to thirty minutes. He uses a 0·5 per cent. solution of cocaine. This is injected first in the outer covering, then into the substance of the nerve.—*Journ. Med. Ass.*, Chicago, 23rd February 1902.

IODIDES IN ARTERIO-SCLEROSIS.

JODLBAUER holds that the beneficial effect of the iodides in arterio-sclerosis cannot be due to its power as an absorbent. In many cases improvement is much too rapid. Neither does he accept the suggestion of Schönfeldt that the specific iodide action depends on increased lymph flow. Jodlbauer thinks that the beneficial action is due to the dilating effect of iodides on the peripheral circulation. It has been shown that when the arterial tension is very high, the amount of blood expelled at each systole is reduced. If the pressure be reduced this stagnation is relieved, the cardiac contraction is more efficient, and blood current and lymphatic circulation are improved. In this way the cardiac muscle and tissues generally are better nourished.—*Munchen. med. Wchnschr.*, 1902, No. 16.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF

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THE RELATIONSHIP OF HÆMORRHAGE INTO THE PANCREAS AND SUDDEN DEATH.

In 1874, Zenker stated that hæmorrhage into the pancreas was a cause of sudden death, and explained the phenomenon by the reflex stoppage of the heart through excitation of the solar plexus thereby produced. Reubold subsequently combated Zenker's hypothesis, arguing that it was untenable, since, in various conditions of enlargement, and of surgical interference with the pancreas, no similar effect was ever produced. In fact, the organ showed no such great sensibility as Zenker attributed to it. Kratter now publishes the results of his observations upon the frequency of hæmorrhage in the pancreas, namely, fifty-three cases in ten years, and arrives at the following conclusions, which appear to be fully justified by the facts adduced:—(1) Hæmorrhages in the pancreas occur by no means infrequently in cases of sudden death. (2) Such hæmorrhages in and around the organ are not the cause, but the result of sudden death. (3) They possess diagnostic importance in relation to the mode of death, inasmuch as they indicate that death was accompanied by spasmodic contraction of the diaphragm (*e.g.* in asphyxia). Kratter is inclined to regard the condition as similar in every way to the hæmorrhages which are found to occur in various parts of the body in cases of sudden death from asphyxia, whether this be produced by internal causes—*e.g.* epilepsy, paralysis of the heart, compression of the brain, etc.—or by violence, and therefore he regards such hæmorrhages not as a cause, but rather as a valuable sign, of sudden death.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xxxiii. Heft 1.

THE PRESENCE OF ARSENIC IN THE ORGANS OF THE HUMAN BODY, AND ITS DETECTION BY THE BIOLOGICAL METHOD.

Ziemke (*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xxiii. Heft 1) has subjected the statement of Gautier (see this Journal, vol. vii. p. 189), that arsenic is a normal constituent of the human body, and is constantly present in certain organs, such as the thyroid gland, brain, hair, skin, etc., to experimental investigation, with the result that he can find no corroboration of its truth. When Gautier published his discovery, it struck every one as strange that he should have been able to find what many distinguished chemists had sought for in vain, when using practically the same methods for the detection of arsenic. Gautier tried to account for this by the imperfections of the methods employed by others to destroy the organic matter, while he himself used a new method, in which the organic matter was got rid of by means of HNO_3 and H_2SO_4 acids.

Ziemke performed a large number of analyses for arsenic in various organs, and employed not only Gautier's method for the destruction of the organic matter, but also that of Fresenius-Babo and others. In all instances negative results were obtained, not a trace of arsenic being discovered in any of the organs examined. Finally, as a control to these chemical methods, he employed the biological test, which, as is well known, consists in the generation of a garlic odour by cultures of certain moulds (*Penicillium brevicaule* is the best), grown upon a medium containing arsenic.

The method is exceedingly delicate, $\frac{1}{100}$ mgrm. of arsenic being easily recognised, and sometimes even the millionth part of a milligramme giving the characteristic odour. The results of the biological tests fully bore out the chemical analyses, *i.e.*, they were wholly negative. Ziemke suggests that Gautier's experiments were falsified by the metal having been introduced into the bodies from without, *i.e.*, ingested during life, and the circumstance that the latter found arsenic in some organs and not in others is explained by the fact that arsenic is eliminated from the different organs with varying rapidity.

ACTION FOR MALPRAXIS.

A CASE of considerable interest has been recently decided in Berlin. The defendant was Professor Dührssen, formerly assistant to Dohrn of Königsberg, and to Gusserow of Berlin, who has a private gynæcological hospital and a large practice in Berlin. He is the author of several well-known works and papers dealing with gynæcological subjects, and has the reputation of being a good teacher and operator, although somewhat *messerfreudig*.

The facts seem to be that a childless lady, who stated her age to be 42, but who was really 45, was very desirous of having a child. She had been for five months under treatment by Dr. Pautz, a former assistant of Dührssen, for some gynæcological ailment, and at the end of this time entered the private hospital of Dührssen. Some discrepancy of evidence existed whether this was solely for the purpose of having an operation performed to try and overcome her sterility, or whether it was intended for the relief also of other conditions. The negotiations for her admission were conducted between Pautz and Dührssen by telephone, and after admission to the hospital she was examined, and the anamnesis taken by Dr. Obuch, Dührssen's assistant. It was alleged that she was never examined by Dührssen, and this seems to be the fact, except that while she was under chloroform, immediately prior to the operation, he made an examination; and found several adhesions of the retroflexed uterus to the rectum and surrounding parts. During the operation uncontrollable hæmorrhage occurred, and in order to save the life of the patient Dührssen extirpated the uterus. The patient made a good recovery, and returned home in fourteen days. Her husband subsequently commenced an action, on the grounds that his wife could now have no hope of bearing a child, and that the major operation had been carried out without his own or his wife's consent. Three formal charges were made:—(1) Of injury, to the danger of life; (2) that there was no justification for the operation, so far as regards relief of sterility; and (3) that he did not examine the patient himself, or secure the consent of the husband or wife for the operation.

As is usual in Germany, before proceeding to trial, the facts were submitted for an opinion to two standing commissions, namely, the Medical College of the province of Brandenburg, and the State Scientific Board for Medical Affairs. Both these bodies gave an opinion unfavourable to Professor Dührssen.

As experts at the trial, some of the chief gynæcologists in Germany appeared; such as Fritsch of Bonn, von Winckel of Munich, Küstner of Breslau, Gusserow, Landau, and Kossmann of Berlin, etc. Professor Fritsch was the first expert witness, and in consequence of his evidence the case collapsed, and a verdict of not guilty was returned. Fritsch's evidence was on the following lines:—That while it was desirable and usual for a surgeon to examine a patient himself before undertaking an operation, yet there were cases where one might leave the examination to an assistant. After this expression of opinion from such a high authority, the question at issue was practically narrowed to this: Did the lady put herself under Dührssen's care for the relief of uterine trouble, or simply, as she alleged, for the cure of her sterility, if this was possible? Fritsch thought that a patient who had been under treatment for five months by another doctor, and was recommended by him to go into a hospital, must have been suffering from some complaint, and that both the patient and her husband must have been aware of the reason why she went there, and of the nature of the operation intended to be performed. The question whether the primary operation, if intended simply to cure sterility, was likely to be successful, and whether it was to be regarded as a dangerous operation, was one, Fritsch stated, which depended upon the scientific beliefs of the individual operator. For his part, he regarded the operation as difficult, and one not likely, under the circumstances, to be followed by success. If Professor Dührssen, however, was of opinion that he could obtain a cure of the condition by means of an operation, then he was entitled to act according to this belief.

All the scientific boards and experts were of opinion that the extirpation of the uterus was necessary in order to save the life of the patient from the uncontrollable hæmorrhage which occurred during the operation, which they further held was skilfully performed; also that it was, under the circumstances, impossible to obtain the consent of the patient or of her husband to this part of the operation.—*Allg. Wien. med. Zeitg.*, 1902, No. 11.

SERUM DIAGNOSIS OF HUMAN BLOOD.

CORIN finds that the potent agent in the serum injected into an animal is paraglobulin, and likewise that in the active serum afterwards obtained from the animal, paraglobulin is the effective constituent. Since many difficulties have to be overcome in connection with the use of blood serum, and as human transudations and exudations (ascitic and pleuritic fluids) contain paraglobulin, Corin advises the employment of the latter. He treats the ascitic fluid with magnesium sulphate, saturated at 30° C. The precipitate thus obtained is dissolved in water, and the solution again saturated with the salt, after which the precipitate is allowed to dry upon the filter. After a few days a white powder is obtained, which contains magnesium sulphate, and which may be dissolved in water and injected into animals. Although ascitic fluid has a much less active specific effect than blood serum, yet, when treated in the above manner, the solution obtained is found to contain about 4·5 per cent. of paraglobulin, and is therefore richer in this substance than human blood serum. This solution, when injected into an animal, produces an active specific serum. Corin finds that the rapidity of the specific reaction is greatly influenced by temperature, and, in contradistinction to most authors, who regard 37° C. as the maximum, he finds that better results are obtained at 45°, and that a temperature of 50° may be used without disadvantage. The potent constituent of the active serum, Corin states, is also paraglobulin, and he finds that the best method of preserving the active serum is to treat it with magnesium sulphate, and thus to obtain a white precipitate of paraglobulin. Owing to a certain amount of magnesium sulphate being still retained in the precipitate, the paraglobulin is easily soluble in water, forming an opalescent solution which produces a characteristic cloudiness when added to human blood serum, or to a solution of blood.

Stated briefly, Corin's investigations prove that one can obtain an "active" serum for human blood serum when a dog is inoculated with the serum globulin, or globulin from a human transudation fluid, instead of with human blood serum. Further, that in the "active" serum, paraglobulin is the potent constituent, and, after precipitation by means of magnesium sulphate, it can be preserved in this form for a long period. The advantage of using paraglobulin lies in the fact that one has then only to prepare, for use, a solution of the active agent, and not of other inert albumins.—*Vrtljschr. f. gerichtl. Med.*, Berlin, Bd. xxiii. Heft 1.

DISEASES OF THE EYE.

UNDER THE CHARGE OF

GEORGE A. BERRY, M.B., F.R.C.S.Ed.,

OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY;

AND

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ASSISTANT OPHTHALMIC SURGEON, EDINBURGH ROYAL INFIRMARY.

PERFORATING WOUNDS OF THE GLOBE.

THE sheet-anchor of the surgeon who is called upon to treat sympathetic ophthalmia is mercury; some administer it in one form, others in another, but its employment in this dreadful condition is practically universal. The benefit gained by its use after such a condition has been established has led Schirmer of Greifswald to begin to administer it in cases of such accidental injuries as might perhaps after the lapse of some time cause sympathetic mischief to arise. For some time past, therefore, he has begun to administer mercury in every case of infected perforating wound of the eye. After he had for a time made a regular practice of acting in this way, he began to notice that he was inclined to delay longer and longer the excision of eyes which previously he would unhesitatingly have condemned to immediate removal, and under patient treatment a number of these, as we shall presently show, have regained or retained useful vision. A still more striking fact is, that during six years he has not had one case of sympathetic disease arising in his hands. His watchwords of procedure may be said to be—Early, Plenty, Long. As regards the first point, it appears, from his account of his cases. that in practically all the cases which did not come under his care until the fourth day from the receipt of the accident had passed, removal of the globe had to be performed; while of those which came under treatment before the second day, fully two-thirds recovered. It is obvious, therefore, that the treatment should be begun immediately.

In regard to the second point, Schirmer expresses himself thus:—"When a case of infected wound of the globe comes for treatment, I ask myself, not how severe is the case and how much mercury will be necessary to cure it, but simply how much mercury can the patient bear?" In many of his cases, in order to start the process rapidly, intramuscular injections of biniodide of mercury were employed at first, but the chief mode of administration was inunction with unguentum hydrargyri. Of this he gives to a man from 8 to 9 grms. daily; to a woman, from 6 to 8; to a child, from 1 to 3, according to the age. For the sake of the local influence which it exerts upon the lymph circulation, not for any systemic effect (for he gave too little for that), nearly every patient received subconjunctival injections of corrosive sublimate, and after a day or two there was substituted for this the better tolerated, though certainly less efficient, salt solution. While this treatment was going on, the patient was kept in bed and well fed, and the utmost care was exercised to see that the mouth was kept in good order. Mercury under these conditions was found to be very well borne.

The third point is also one of great importance, though it is of course impossible to lay down any hard-and-fast laws as to the duration of the treatment. A few times it happened to Schirmer that after the inunction had been stopped, in the belief that symptoms had finally ceased, they reappeared, and were much more obdurate to deal with than previously. His results may thus be summarised:—31 per cent. had to suffer enucleation; 21 per cent. recovered with less vision than $\frac{1}{10}$; while 48 per cent. recovered with "useful" vision.—*Arch. f. Ophth.*, Leipzig, Bd. liii. S. 1.

ICHTHYOL IN TRACHOMA.

WHEN a large number of different modes of treatment are suggested for any disease, the probabilities are either that it is a very intractable malady, or that it has a strong disposition towards spontaneous recovery. In the first of these directions, trachoma is no exception to this general rule, for it resists more or less successfully any and every method of attack. Its course, however, can be modified, and the condition of the patient much improved, by judicious treatment. Eberson pointed out some years ago, that the essentials of any treatment likely to prove effective were fairly well afforded by ichthyol. These essentials he laid down thus:—The application must constrict the dilated vessels, remove the infiltration and thickening of the conjunctiva, and alleviate the various subjective symptoms, particularly the pain, the lachrymation, and the photophobia. He found that ichthyolate of ammonia, in 50 per cent. solution, met these requirements better than any other application he had yet employed. Jacovides also, and Darier, have spoken highly of ichthyol in trachoma. The latter used it undiluted, but this does not seem to be a wise example to follow. The former employed the drug in a great number of different affections of conjunctiva and cornea, and found that its action on the pannus of trachoma was specially marked and beneficial. Denti, too, used ichthyol in trachoma. In his experience the acuter forms were much more favourably influenced by it than the more chronic; its action was specially valuable in cases showing superficial ulceration along with pannus. Bialetti speaks strongly in favour of a lotion of ichthyol (50 per cent.) painted on the everted upper lid and then washed off with distilled water. The first effect of application is a slight burning sensation, which quickly passes off, and is succeeded by relief from photophobia, blepharospasm, and pain, and this relief is not merely transitory. The vessels of the pannus shrivel up under its use, and the corneal opacity clears. It is considered to be chiefly in virtue of its deoxidising effect upon tissues that its antiseptic action is due: it cuts off the supply of nutriment for the micro-organisms rather than directly kills them. Bialetti warmly recommends its employment.—*Clin. ocul.*, Palermo, June 1901.

Membranous Conjunctivitis.

At a recent meeting of the Ophthalmological Society, two papers of interest were read which dealt with this subject, particularly in connection with the relation between membranous conjunctivitis and true diphtheria. Mr. Jessop gave precise particulars of thirteen cases, in all of which a very distinct membrane existed, varying in consistency from thin and delicate to the firmness and toughness of strong wash-leather, and in colour from white to yellow; it was present from two days to eleven, and when stripped off left a raw granulating surface. In all his cases save one the pre-auricular glands were enlarged, but in only two did the cornea suffer, and one of these was (bacteriologically) non-diphtherial. In eight cases the Klebs-Löffler bacillus was identified under the microscope, and its presence verified by means of cultivation and Neisser's reaction, and by the symptoms produced in a guinea-pig. In no case were there any late paralyses. Mr. Jessop thinks that the clinically very convenient term "membranous conjunctivitis" must be held to include two entirely different conditions—the diphtherial and the non-diphtherial.

Mr. Stephenson, who read the other paper, based his observations upon forty-three cases. In thirty-two of these the condition was unilateral; in thirteen cases the cornea suffered to some extent, at least temporarily; death occurred in one patient; there were no instances of peripheral paralysis. In every single case the Klebs-Löffler bacillus was found, associated in most cases with certain other organisms, but pure in six. He firmly believes that in all such cases the first thing to do is to administer antitoxine without waiting for any confirmation of the diagnosis; he has never known it do any harm, and more especially is it indicated if the cornea is at all affected. Locally, he employed corrosive sublimate lotion by means of a spray, potassium permanganate, and nitrate of silver. He believes "croupous conjunctivitis" and diphtheria of the conjunctiva to be one and the same disease, and to be both unquestionably due to the Klebs-Löffler bacillus. In only five cases had he failed to find that organism in association with membranous conjunctivitis. In the discussion which followed the reading of the papers, certain of his critics thought Mr. Stephenson was a little too ready to diagnose diphtheria from a bacteriological point of view, and accepted proof of the identity of the organism too easily,—which indeed seems all the more probable from a clinical point of view, since the percentage of such cases among all diseases in his clinique seems out of all proportion to their frequency in the experience of others.—*Ophth. Rev.*, London, April 1902.

REPORTS OF THE MEDICAL SOCIETIES.

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Edinburgh Medico-Chirurgical Society.—*7th May* 1902.—Prof. **Fraser**, President, in the chair.—Dr. **Norman Walker** showed three cases of lupus treated by various methods of photo-therapy.—Mr. **Alexis Thomson** showed a patient after removal of hyperostosis of the upper jaw and malar bone (with photographs).—Dr. **M'Bride** showed a case of nasal deformity treated by paraffin injection.—Mr. **Stiles** showed—(1) A boy after operation for large intradural abscess, following middle ear disease; (2) child after reduction of congenital dislocation of the hip by Lorenz's method.—Dr. **Bruce** showed—(1) A case of paralysis and spasm of the ocular muscles; (2) two cases of spastic paralysis following whooping-cough.—Mr. **Cotterill** showed—(1) A case of multiple scirrhus treated by oöphorectomy and X-rays; (2) a case of multiple arthritis.—Mr. **Cathcart** showed a stretcher adaptable to the Trendelenburg position.—Drs. **Melville Dunlop** and **Stuart M'Donald** showed a liver from a case of congenital obliteration of the bile ducts.—Mr. **Caird** read a paper on "Gastro-enterostomy—twenty-one cases performed for intrinsic stenosis of the pylorus." The symptoms calling for the operation are difficulty in taking food, temperature tending to be subnormal, and progressive emaciation. Absence of hydrochloric acid and other symptoms are not always certain indications of malignant disease, and many malignant cases cannot with certainty be diagnosed from simple stricture. The operation saves life in simple cases and in malignant makes life more comfortable, even though it does not prolong it. The operation should be performed with as little delay as possible, and washing out of the stomach should be avoided, though it may be done if the patient, as is often the case, is accustomed to this. The conditions revealed on exploration determine the method selected. The use of clamps and buttons should be avoided. Of the twenty-one cases, thirteen were posterior gastro-enterostomies and eight anterior. There were four deaths in the twenty-one cases—one from pneumonia, one from peritonitis of the abdominal wall, one of shock, and one of a leak into the peritoneal cavity. In some cases complete disappearance of the tumour takes place after the operation, even in cases where no operation beyond simple opening of the peritoneal cavity was done, much in the same way as a tuberculous peritonitis disappears after a similar manœuvre. Prof. Chiene and Mr. Alexis Thomson discussed the paper.—Dr. **Lovell Gulland** read a paper on "Cyto-diagnosis in Pleural Effusions" (with microscopic demonstration). The fluid withdrawn from the chest is examined for organisms and for cells. Streptococci and staphylococci may cause serous effusions, which may go on to pus or may be absorbed. It is difficult to find tubercle bacilli even in undoubted cases of tuberculous pleurisy. This may be due to destruction of the bacilli having taken place, or to the tuberculous toxines and not the bacilli being the cause.

EDINBURGH OBSTETRICAL SOCIETY.—14*th May* 1902.—Dr. JAMES RITCHIE, President, in the chair. — SPECIMENS. — Professor SIMPSON showed—(1) An anencephalic fœtus; (2) ovarian dermoid tumour; (3) fibroma of the ovary; (4) hydatid of the ovary; (5) Bossi's dilator.—Dr. BERRY HART showed—(1) Cancer of the cervix removed by vaginal hysterectomy; (2) malignant tumour of the ovary; (3) hydrosalpinx.—Dr. HAULTAIN showed—(1) An ovarian cyst with double pyosalpinx, which had ruptured into the intestine; (2) ovary showing the possibility of ovarian pregnancy; (3) uterus, to the naked eye healthy, from which scrapings of adeno-carcinnoma had been removed; (4) fœtus dicephalus, quadripes, tribrachius.—Dr. FORDYCE—Fibroma of the ovary.

COMMUNICATIONS.—Dr. BERRY HART read a paper on "The Development of the Amnion and the Cord." Dr. Hart advanced the opinion that the germ layers in the human germinal area were inverted, as in the guinea-pig, *i.e.* really that the human amniotic cavity was not formed by folds, but by the formation of an ectodermic plug with central breaking down. —The PRESIDENT read a paper on "A Case of Acute Pyelitis in Infancy." —Dr. JOHN THOMSON read "Notes on the Symptoms and Treatment of Acute Pyelitis in Infants." He pointed out the importance of examining the urine in all acute feverish conditions in infants, and expressed the opinion that acute pyelitis was the only condition which caused rigors in a child under two years of age. He gave the records of eight cases, describing in detail the symptoms and diagnosis. The best treatment was the administration of full doses of citrate of potash.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.—*May* 12, 1902.—Mr. H. E. CLARKE, president, in the chair.—Mr. A. E. MAYLARD showed as a card specimen a case of arterio-venous aneurysm of the ulnar artery and anterior ulnar vein in the lower third of the forearm, which resulted from a wound with a Mauser bullet at Magersfontein. The ulnar nerve was also injured, and there was complete loss of power in the region of its distribution.—Mr. R. H. PARRY showed—(*a*) A retroperitoneal tumour (fibro-lipoma) weighing 8 lbs., which was removed successfully by operation, through the abdomen. (*b*) A retroperitoneal tumour (myoma) weighing 8½ lbs., removed by operation; it proved to be adherent to the diaphragm, and was removed with difficulty. Patient died in a few hours from respiratory failure. (*c*) Two prostatic tumours removed after Freyer's method. Both patients recovered, and did very well.—Dr. HENRY RUTHERFURD showed—(*a*) A case of secondary suture of the musculo-spiral nerve in which it was found necessary to resect a portion of the humerus; the case resulted from a severe compound fracture, and there was a wide gap between the ends of the nerves. The result was very satisfactory. (*b*) A tubal gestation sac successfully removed for intraperitoneal rupture and hæmorrhage. (*c*) An ill-developed and incompletely descended testicle, removed in an operation for radical cure of hernia; naked eye and microscopical specimens were exhibited. (*d*) A vermiform appendix, showing localised acute inflammatory change from the sac of a strangulated femoral hernia.—Dr. J. M. Cowan showed a specimen, with microscopical preparations, of an acute aortic lesion—acute inflammation of the cusps of the valves with endarteritis of their nutrient arteries, leading to a very flabby condition, hyaline degeneration, and incompetency of the valves.

Glasgow Medico-Chirurgical Society.—*May* 2, 1902.—Drs. W. A. Parker and G. W. Nicol showed a case of multiple hypertrophy of the sebaceous glands of the face in a congenital epileptic. The rash is most prominent on the nose and cheeks, and closely resembled acne rosacea. The patient is a female, æt. 17. The eruption was first seen at the age of 6, and recurred each year in the spring time. It is characterised by a moderate amount of irritation. There are other malformations of the skin, in the form of soft warts on the back.—Drs. W. G. Dun and A. W. Russel reported a case of contracted pelvis and pregnancy, terminated at full time by symphysiotomy. The true conjugate diameter was reckoned at 2¾ in. The child is alive, and the patient is now able to walk without any inconvenience.—Dr. Edington showed a cyst of persistent thyro-glossal duct. The patient was a boy, æt. 17. When first seen by Dr. Edington, he had a swelling about the size of a walnut above the manubrium sterni. The swelling was fluctuant, and the skin over it was red and adherent. From its upper end a cord stood out, making a ridge in the neck. An incision was made in the middle line of the neck, and an ellipse of skin was removed over the swelling. The cord was found to disappear in the thyro-hyoid membrane behind the hyoid bone, and was cut across at this point. After removal, the swelling was found to be a chronic abscess, with which the cord had no communication.

OBITUARY.

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Archibald Dickson, M.D., F.R.C.S. Edin.

Although it has been known for some time that Dr. Dickson's health had been causing uneasiness to his relations and friends, it was not generally recognised that there was any immediate danger, and the news of his death, which took place last month, aroused equal surprise and regret.

Archibald Dickson belonged to a family of intellectual distinction, and, like his elder brother Alexander, the late Professor of Botany in Edinburgh, he was a man of much and varied ability. Born in 1837, he studied medicine in Edinburgh, graduating as M.D. in 1863, and taking the Fellowship of the Royal College of Surgeons the following year. For some years he was a popular member of the staff of the New Town Dispensary, and for a considerable period he was the devoted Visiting Physician to the House of Refuge in the Canongate. His contributions to medical literature were by no means copious, for he found it difficult to satisfy himself either with the substance or the form of his efforts. His desire for absolute truth and lucid expression was so great as to render him hypercritical as regards his own work. In the same way he could not endure to undertake the teaching of any subject that he had not perfectly grasped. It is well known to some of us that he at one time contemplated the delivery of a course of lectures upon Pathology, but conceiving it to be his duty to understand the principles of the microscope, he underwent a severe preliminary course of study upon optics. Not satisfied with the works of Beale, Carpenter, and Quekett, he went to the fountainhead, and applied himself to the treatises of Wollaston, Brewster, and Newton. In this way, led by an almost painful sense of scrupulous honesty, he was turned aside from his original intention, and, to the deep regret of those who knew him intimately, what would certainly have been a most interesting series of lectures was never delivered.

On the death of his elder brother, Dr. Dickson became proprietor of Hartree, near Biggar. Resigning his appointments in Edinburgh, he took up his residence at his country house, where he lived until the end came. He showed in his new sphere the same beautiful character which had endeared him to his friends in the city. A man at all times of rare benevolence and perfect charity, he was as a landlord conspicuous for his efforts on behalf of the tenantry, to whom he was endeared by countless acts of kindness and generosity. Just as he used to be tireless in his devotion to the sick poor of the city, so he was indefatigable in his labours for the good of those by whom he was surrounded in his country home. By them and by a wide circle of friends he is deeply regretted, and the warmest sympathy is felt for his sister, who has shared his duties for many years.

ANALYTICAL REPORTS.

Virol.

(Virol Limited, London.)

Virol is certainly a most valuable preparation. By practical experience we are justified in saying so. A multiple mixture, cunningly prepared, Virol is much more palatable to the majority of mankind, either the young or of mature years, than any form of Oleum morrhuæ, whether natural, so-called tasteless, or combined in emulsions with other substances. And the fats in it are those naturally taken in ordinary articles of diet. And many more substances of nutritive value are present.

The most important constituents, from which the name is partly derived, are undoubtedly the fats obtained from bone marrow, along with fats from beef, and yolk of egg, in a state of minute division. Beef and egg proteids, extract of malt, carbohydrates, and the salts of beef flesh, of eggs and of egg-shells, go up to complete the sum. Few artificial food preparations or adjuvants afford a sufficiency of fats in so readily an assimilable form. Still less numerous those which, while rich in fats, do not prove distasteful to the consumer, at once or after a shorter or longer time, and therefore of doubtful value.

In look and consistence somewhat like "run" honey, but of darker colour; to taste, also not unlike honey; in use, taken alone, spread on toast or biscuits, or dissolved in water, milk, etc. It possesses the important property of partly mixing with and partly dissolving in aqueous fluids. All which supports our prefatory statement—Virol is a most valuable preparation.

Chivers' Jellies and Lemonade.

(Chivers & Sons Limited, Histon, Cambridge.)

Messrs. Chivers have sent us samples of their well-known articles in the entremets line, to wit—a tablet for making lemon jelly, a powder for the manufacture of blanc-mange, and a granular powder for preparing stock for lemonade.

No comments are needed with regard to the tablet, which serves to generate an excellent table jelly, tasting pleasantly and freshly of lemons. The blanc-mange powder, when mixed with milk as per directions, forms a *very* satisfactory "cold shape." The Cambridge lemonade is a bright lemon-yellow coloured crystalline powder, which, dissolved in a pint of water along with ¾ lb. of sugar, affords a syrup worthy of being conserved in a stoppered or tightly-corked bottle, in view of the refreshing beverage, half an ounce of it or thereabouts, *ad gustum*, mixed with water, plain or aerated, provides. The crystals contain no alien acid, nor any but cane-sugar.

Submitting samples of Cambridge lemonade thus concocted to various expert authorities on this cheering while non-inebriating liquor, we received an assurance from them that the flavour was excellent, and the product both seductive and desirable. Apart from their usage by the healthy, Chivers' jellies, lemonade, etc., are well adapted for employment in the sick-room, and can always be depended upon for purity and innocuousness.

MONTHLY NOTES
ON METEOROLOGY AND VITAL STATISTICS.

By A. LOCKHART GILLESPIE, M.D., F.R.S.E., F.R.C.P.Ed.,
MEMBER SCOTTISH METEOROLOGICAL SOCIETY.

METEOROLOGICAL MEANS FOR THE EAST OF SCOTLAND DISTRICT, FOR THE FOUR WEEKS ENDING APRIL 26, 1902; AND FOR THE YEAR FROM JANUARY 1.

	Temperature.			Rainfall in Inches.		Sunshine Hours.		Mean Daily Variability of Temperature.
	Mean.	Accumulated Day-Degrees.		Actual.	Accumulated from Jan. 1.	Actual.	Accumulated from Jan. 1.	
		Above 42°	Below 42°.					
Mean	43°·2	*[1] 124° [2] 266°	79° 583°	1·7	9·3	127	342	2°·75
Observed	42°·7	[1] 122° [2] 249°	96° 654°	1·9	6·7	155	345	3°·4
Difference	−0°·5	[1] −2° [2] −17°	+17° +71°	+0·2	−2·6	+28	+3	+0°·65

VITAL STATISTICS.

MORTALITY IN FOUR LARGE TOWNS IN THE EAST OF SCOTLAND (EDINBURGH, DUNDEE, ABERDEEN, AND LEITH), DURING APRIL AND SINCE JANUARY 1, 1902. Actual Numbers and Rate per 10,000 per annum.

	Total.		Constitutional Diseases.		Circulatory System.		Respiratory System.		Nervous System.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 1251 [2] 5176	208 215	241 948	40·0 39·5	122 486	20·5 20·5	241 1141	40·0 47·4	134 563	22·4 23·4
Actual Deaths and Rate per 10,000	[1] 1191 [2] 5072	198 210·7	223 936	37·1 39	140 593	23·4 24·5	255 1117	42·4 46·4	133 547	22·3 22·7
Difference from Mean	[1] −60 [2] −104	−10 −4·3	−18 −12	−2·9 −0·5	+18 +107	+2·9 +4·0	+14 −24	+2·4 −1·0	−1 −16	−0·1 −0·7

	Digestive System.		Urinary System.		Pneumonia.		Phthisis.		Cancer.	
	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.	No.	Rate.
Deaths expected and Mean Rate for 1891–1900	[1] 68 [2] 299	11·3 12·5	33 127	5·5 5·3	100 430	16·7 17·9	122 485	20·3 20·1	49 208	8·1 8·6
Actual Deaths and Rate per 10,000	[1] 65 [2] 303	10·8 12·6	39 136	6·5 5·6	149 566	24·7 23·5	103 428	17·1 17·8	52 237	8·6 9·9
Difference from Mean	[1] −3 [2] +4	−0·5 +0·1	+6 +9	+1·0 +0·3	+49 +136	+8·0 +5·6	−19 −57	−3·2 −2·3	+3 +29	+0·5 +1·3

* NOTE. The figures [1] denotes the data for April, [2] for year to date.

The four weeks ending on the 26th of April 1902 were colder than usual by half a degree *per diem* of mean temperature. The nights were relatively colder than the days, leading to a greater excess of day-degrees below 40° Fah. than decrease of those recorded above it. A slight increase in the rainfall was registered; very largely due to excessive precipitation in Aberdeenshire. The number of hours of bright sunshine reported was as much as 22 per cent. above the average, the mean daily variability of temperature 23 per cent. above.

The first four months of 1902 have been characterised by lack of warmth, and more especially by excess of cold temperatures. The total rainfall still remains far below the normal; the total number of hours of bright sunshine yield a slight increase.

The mortality in the four towns in April was considerably below the normal; constitutional, phthisical, digestive, and nervous causes contributing to this decrease. Deaths from pneumonic, circulatory, respiratory, urinary, and cancerous diseases were more numerous than usual. Influenza was reported to have caused twenty-seven deaths.

The year to date has been chiefly noticeable for the great increase in the fatalities from pneumonia, circulatory diseases, and cancer. The increase under pneumonia now has reached to 31·6 per cent. above the mean.

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